EARLY US ARMOR

Armored Cars 1915–40

STEVEN J. ZALOGA

ILLUSTRATED BY FELIPE RODRÍGUEZ

NEW VANGUARD 254

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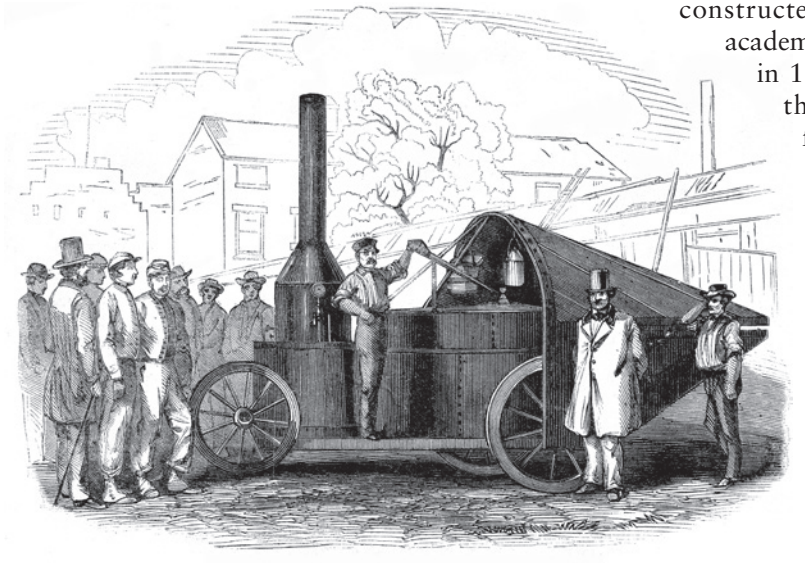
EARLY US ARMOR

ARMORED CARS 1915–40

EARLY ROOTS

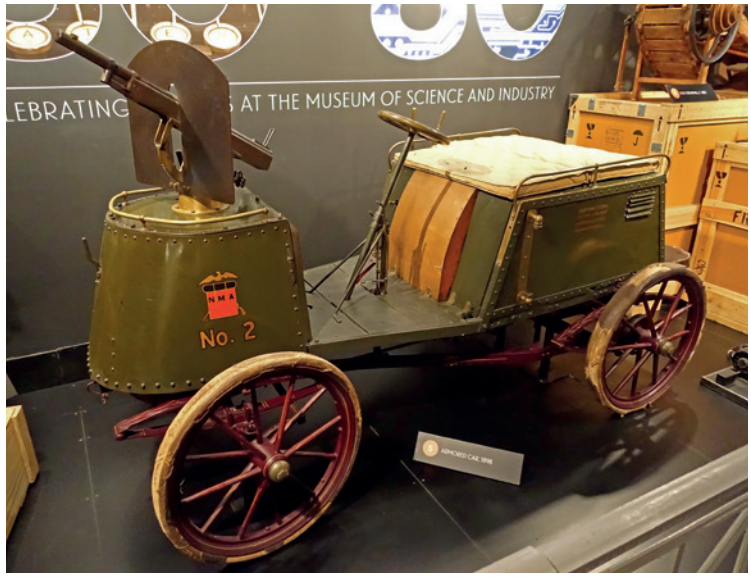
There are a host of legends about the origins of American armored cars, some dating back to the Civil War. The Winans Gun is sometimes described as an armored car, though in fact it was not self-propelled. With the advent of automobiles in the late 19th century, the first primitive armed cars began to appear. These were typically gasoline or steam-powered automobiles fitted with a machine gun. The machine guns were often fitted with small armored shields, leading to their classification as armored cars. By today's definition, these were not true armored cars since they lacked significant armored protection. Here they are called "armed cars."

The Regular Army of the United States showed very little interest in early armored cars. However, state National Guard units were spurred on by the local automobile industry and became the vanguards of armored-car development in the United States prior to World War I. The individual most responsible for the early efforts was Major (later Colonel) Royal P. Davidson of the Wisconsin National Guard, and superintendent of the Northwestern Military and Naval Academy on Lake Geneva in Wisconsin. Davidson designed several armed automobiles, constructed with the aid of the academy's cadets. The first of these, in 1899, was built on a Duryea three-wheeled automobile fitted with a Colt-Browning M1895 .30cal machine gun. Davidson felt that these vehicles could form the core of a flying machine-gun patrol, supported by armed motorcycles. In the summer of 1900, Davidson and the cadets drove this armed car from Fort Sheridan, Illinois, to Washington, DC, to deliver a message from the commandant of



The Winans Steam Gun, built in Baltimore in 1861 at the outset of the Civil War, is often cited as an antecedent of American armored cars. In fact, the steam unit was used to power the centrifugal gun, not to propel the vehicle itself. The device did have an armored shield, but it had to be towed into position by horse. This is a contemporary illustration from *Harper's Weekly*, May 25, 1861.

the Wisconsin National Guard to General Nelson A. Miles, the Army Chief of Staff. Miles was impressed enough with this demonstration that in 1903 he recommended to the Secretary of War that five existing Cavalry regiments should be converted to an automobile corps with Davidson's cars. The Cavalry was not amused by this radical proposal and ignored it. In 1900, Davidson and the cadets completed a second armed car on a Duryea quadricycle. After the academy had relocated to Highland Park, Wisconsin, Davidson and his cadets assembled two more designs on steam-powered automobiles. In 1909, Davidson armed a Cadillac automobile as a "machine-gun car." This was followed in 1910 by a pair of Cadillacs armed with machine guns in high-elevation mounts as "balloon destroyers." The first Davidson design that was a true armored car was built in 1915 on a Cadillac chassis. In contrast to the previous designs, it was enclosed on all sides but the top with armor plate. It was armed with a single Colt-Browning .30cal machine gun on a pintle mount with an armored shield. The academy's cadets staged a demonstration, starting on July 10, 1915, with a convoy of Cadillac-based vehicles from Chicago to Los Angeles to demonstrate the viability of army motorization. The trip took 40 days, in no small measure due to the absence of adequate roads in many parts of the western United States.



The steam-powered Davidson Automobile Battery armored car of 1901 was built by the Peoria Rubber and Motor Vehicle Manufacturing Company, based on patents of the Duryea Motor Wagon Company. The vehicle's fuel tank and engine were covered with armor. This is the sole surviving example of Royal Davidson's designs and is preserved at the Museum of Science and Industry in Chicago. (Wikimedia Commons)

Royal Davidson built his first fully armored automobile in 1915 on a Cadillac chassis by Wisconsin's Naval and Military Academy. It is seen here in 1917 during maneuvers at Fort Sheridan, Illinois.

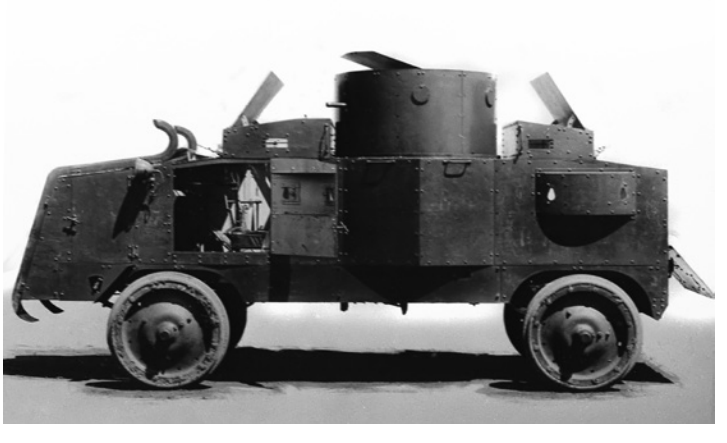
The first armored car serial manufactured in the United States was the Armoured Autocar, built for the Canadian Army in 1914. They languished in obscurity until 1918 when the war in France became more mobile. Re-armed with Vickers machine guns, they saw extensive combat use with the Canadian Motor Machine Gun Brigade. The six surviving vehicles are seen here near Arras in April 1918. (Library and Archives Canada PA-002614)

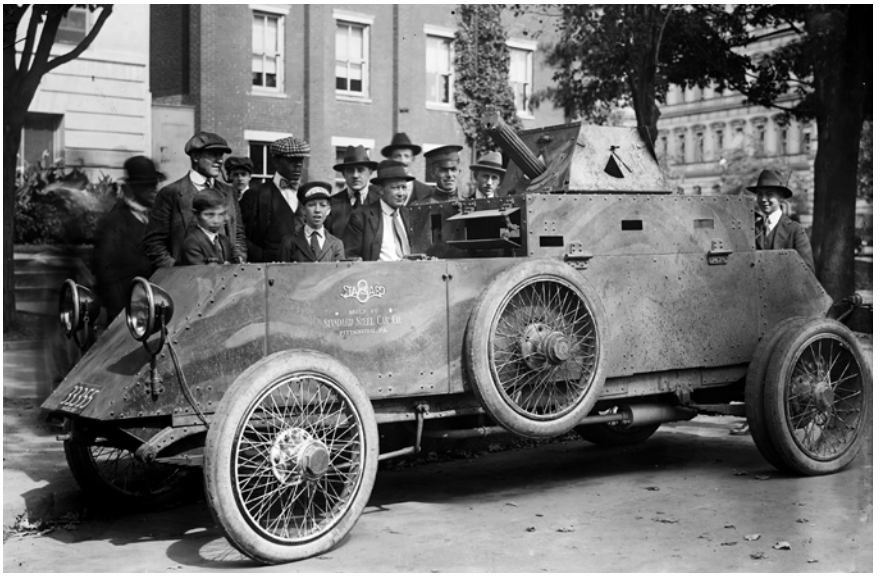
ARMING THE WORLD

The outbreak of war in Europe in 1914 was a major catalyst for the development of armored cars in the United States. Many of the combatants began shopping for automobiles and trucks in the United States, some of which were used to construct armored cars back in Europe. France purchased White automobiles as the basis for their armored cars, and Russia acquired several different types of American vehicles to manufacture their own armored cars including Garford, Jeffery, and White trucks.

Two Canadian projects resulted in the first two American armored cars produced in significant numbers. Raymond Brutinel, a French émigré in Montreal, came up with the idea of creating a unit of machine-gun armed trucks. His scheme was backed by Sir Clifton Sifton, a wealthy businessman in Ottawa. Sam Hughes, the Minister of Militia and Defence, formally approved this project in August 1914. Brutinel took sketches of his design to the United States hoping to find a suitable manufacturing plant. He quickly selected the Autocar Company in Ardmore, Pennsylvania, which was manufacturing a suitable 4x2, 2-ton, cab-over-engine truck with 22-horsepower engine that was already in service with the US Army. A total of eight of the Autocar armored cars were built, each armed with a pair of Colt .30cal M1914 machine guns. These were delivered to Ottawa in early September 1914 and were used to create the Automobile Machine Gun Brigade No. 1. This unit arrived in Britain in October 1914, but became most famous for their actions in 1918 when the stalemate of trench warfare began to end, and more mobile operations resumed.

The Jeffery armored car built for the Canadian Eaton Battery had a single machine-gun turret, rear machine-gun sponsons, and fore and aft driver stations. This was the most numerous version of the type, with over 50 assembled in the United States and Canada.



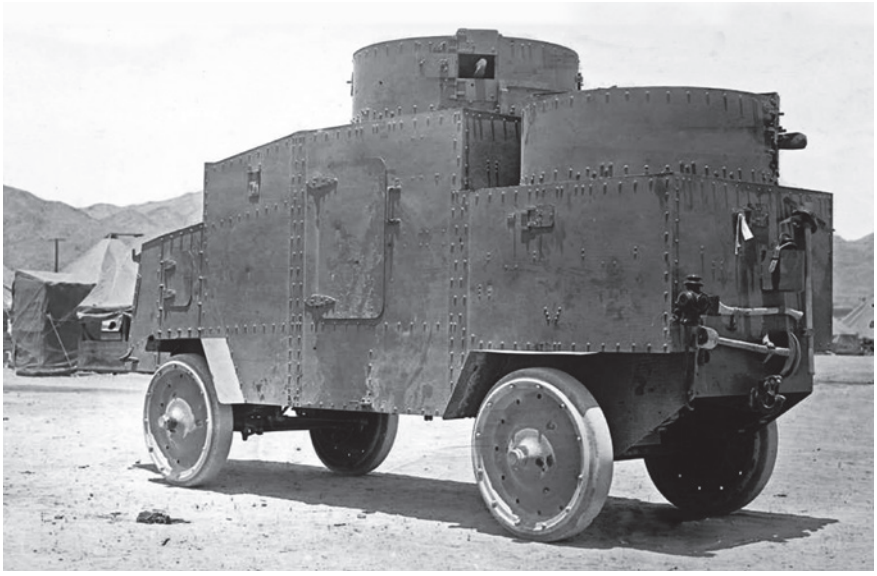


This is one of two armored-car designs by Standard Steel Car Co. built for a French armored-car contract in 1915. The other configuration lacked the turret and had an open roof. In the event, the contracts were canceled as a result of the changing tactics on the Western front. (Library of Congress)

John C. Eaton, the Toronto department store magnate, offered to fund the creation of a second motorized unit equipped with armored trucks armed with machine guns. The Thomas B. Jeffery Company in Kenosha, Wisconsin, was manufacturing a very successful four-wheel drive truck called the Jeffery Quad. Jerry De Cou, the company's superintendent, designed and built an armored car on this chassis as a potential export item. This vehicle went through several iterations. The design selected for the Canadian order had a single turret in the center, and driving stations front and rear. The Jeffery Quad trucks, along with armor plate manufactured by the Bethlehem Steel Co, were imported into Canada by the Canada Cycle & Motor Co Ltd., manufacturers of the Russell trucks. Some of the Jeffery armored cars were assembled in Canada, and so they are sometimes called the Russell armored cars. The Eaton Battery was dispatched to England in September 1915 but, by this time, the fighting had bogged down into trench warfare with little use for armored cars. The Jeffery/Russell armored cars were put into storage, but later sent to India and Ireland to deal with local troubles.

Several other American firms received contracts in 1914–15 to manufacture armored cars, but most of these contracts were canceled after the European battlefield congealed into static trench warfare. The Standard Steel Car Company of Butler, Pennsylvania, designed at least two types of armored cars for the French army, but manufacturing contracts awarded in July 1915 for 200 armored cars were canceled before delivery. The Morton Truck and Tractor Company of Harrisburg, Pennsylvania, designed an armored car with two small machine-gun turrets and won a $1.5 million contract for 300 of these from the Russian government in February 1915. This contract was never fulfilled for unknown reasons. Several other companies developed armored cars from corporate funds in hopes of winning export contracts. For example, the R. E. Olds (Reo) Motor Car Company designed an armored car based on their Model F car chassis. When the European market for these armored cars evaporated in late 1914 due to the advent of trench warfare, some of these armored cars were donated to local National Guard units as is described in more detail below.

The Jeffery armored car, called Armored Motor Car No. 1 by the US Army, was sent to Texas in 1916. This configuration had two machine-gun turrets, armed with the .30cal Benét–Mercié machine gun M1909. It is seen here in El Paso in 1918.



COMBAT DEBUT: THE MEXICAN PUNITIVE EXPEDITION

In January 1915, the Congress passed the Fiscal Year 1916 army budget, allotting $50,000 for the acquisition of armored cars. The development work was undertaken at the Ordnance Department's main production facility, the Rock Island Arsenal (RIA) in Illinois. The FY16 funding permitted the acquisition of four armored cars. The first of these, called Armored Motor Car (AMC) No. 1, consisted of a Jeffery Quad truck chassis purchased on January 12, 1915, and fitted with an armored body and twin turrets at RIA. The body was very similar in design to the Jeffery Quad armored car ordered by Canada except for the turret arrangement. The staff at RIA began by designing a standardized turret that was armed with a single .30cal Benét–Mercié machine gun M1909. This turret used an unusual internal tripod mounting and roof hatch which permitted the machine gun to be used against ground targets, but also to be elevated to high angles for firing against enemy aircraft and balloons.

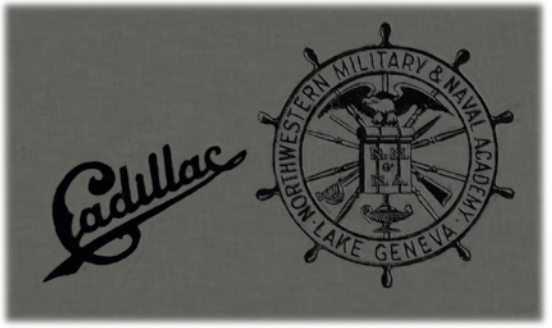
A

1: DAVIDSON CADILLAC ARMORED CAR, NORTHWESTERN MILITARY AND NAVAL ACADEMY, 1915

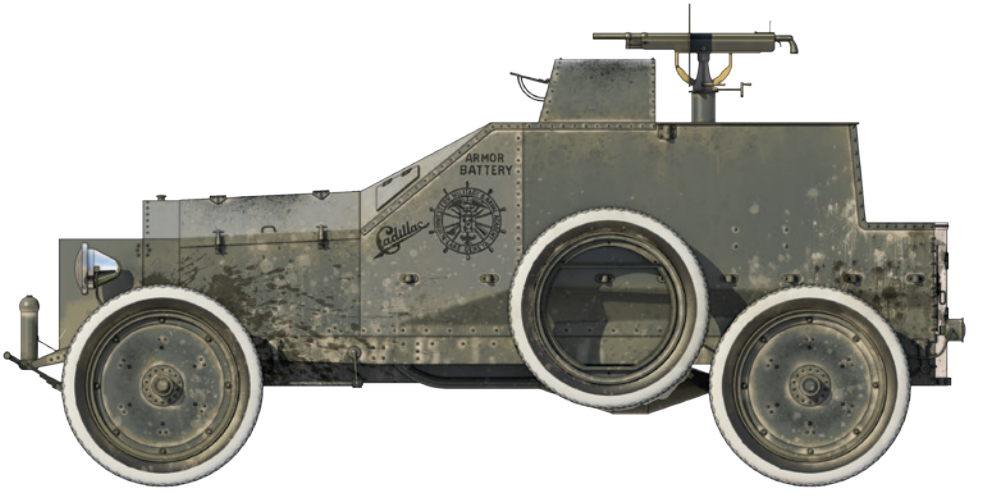
Although the US Army had recommended the use of olive drab as the standard color for military vehicles since the beginning of the 20th century, the other traditional finish for vehicles and Ordnance was "battleship gray." This does not appear to have been any specific shade of gray, but was often a color of convenience. In the case of early armored vehicles, it was probably zinc-rich primer, a common industrial protective paint for steel. The Davidson car has several markings in black, including the "Armor Battery" unit name, the academy's emblem, and the Cadillac logo.

2: LOCOMOBILE ARMORED CAR, 1ST MOTOR BATTERY, NEW YORK NATIONAL GUARD, 1915

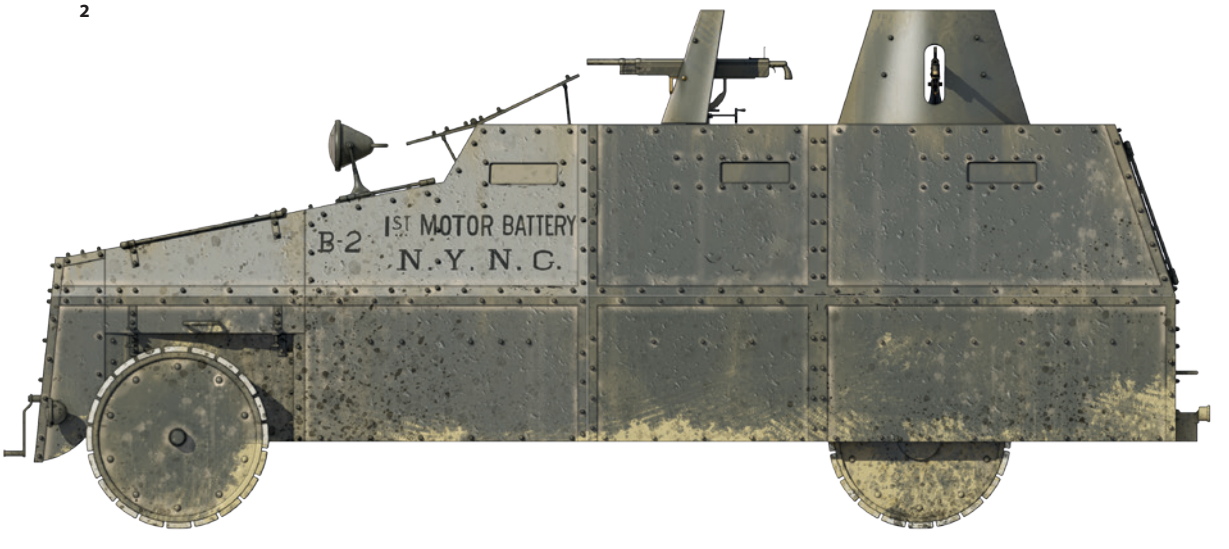
As in the case of the Davidson armored car, the vehicles of the NYNG Motor Battery were finished in light battleship gray, most probably zinc-rich primer. When first in service in 1916, they carried the battery identification on the hull sides, along with individual vehicle identification, in this case, B-2.

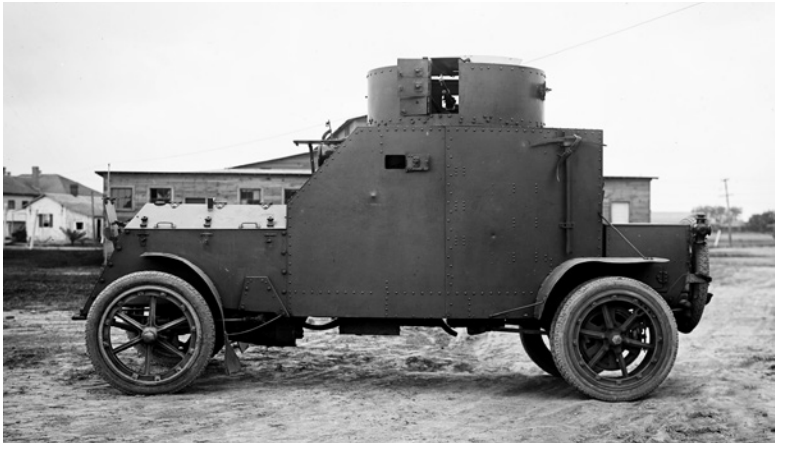

Cadillac
NORTHWESTERN MILITARY & NAVAL ACADEMY
LAKE GENEVA

1


ARMOR
BATTERY
Cadillac

2


B-2
1ST MOTOR BATTERY
N.Y.N.C.



The White armored car, known to the US Army as Armored Motor Car No. 2, was the other type sent to the Texas–Mexico frontier in 1916. It remained on border patrol through 1918 and is seen here in the El Paso area in 1918. (R. Runyon Photograph Collection, The Dolph Briscoe Center for American History, The University of Texas at Austin)

Armored Motor Car No. 2 was based on a White Motor Company 1½-ton 61-TDB chassis purchased on August 31, 1915. The chassis was shortened and modified, and then fitted with an armored body at RIA. It was fitted with the same type of turret as the previous AMC No. 2 except with only a single turret.

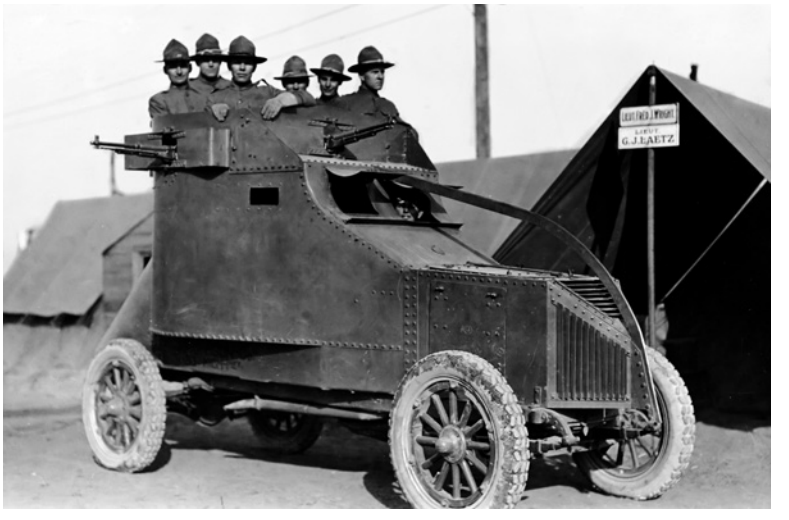
On March 9, 1916, troops under the direction of Mexican revolutionary Pancho Villa staged a raid on the US Army garrison near Columbus, New Mexico. The raid killed ten soldiers and eight civilians, but the attack was repelled with heavy losses to the Mexican forces. In response to the growing turmoil along the frontier caused by the Mexican civil war, President Woodrow Wilson authorized Brig Gen John "Black Jack" Pershing to organize a "Punitive Expedition" to kill or capture Villa. By mid-March 1916, the Regular Army had deployed about 4,800 troops to the border and they began to cross the frontier into Chihuahua. Due to the terrain, the combat forces were largely mounted cavalry. In July 1916, the army ordered RIA to dispatch armored cars to the Texas border and the Jeffery Armored Car No. 1 and White Armored Car No. 2 were sent to the El Paso area.

The road conditions south of the Texas border were very challenging. The early armored cars were too heavy to be used away from roads so they were used mainly to guard the various towns along the border. Reports from Texas were critical of the heavy weight of the Jeffery Armored Car No. 1. A third armored car was built locally using a Ford Model T chassis. The Regular Army armored motor cars remained in Texas into 1917, mostly

At least two armored cars were built on Reo chassis during the war. This one was built by the National Defense Company in Boston, Massachusetts, and served with the Machine Gun Company of the 8th Infantry, Massachusetts National Guard including duty on the Mexican border. It is seen here on display in Washington, DC. (Library of Congress)

in the El Paso area. The Jeffery Armored Car No. 1 remained in Texas for more than a decade after, and a photo shows it in service in 1927 guarding the International Bridge at El Paso.

One incident that would have lingering consequences on the development of American armored cars occurred on May 14, 1916. A small cavalry detachment under Lt George S. Patton conducted a motorized raid against a group of Villa's bodyguards, leading to the death of "General" Julio Cárdenas. A decade later, Patton would come to prominence as one of the cavalry's visionary thinkers. Patton's personal experience convinced him of the need for fast cavalry vehicles even if this meant sacrificing armor. During the 1930s, Patton's influence would lead the Cavalry branch to favor lightly armored scout cars over better-protected armored cars.



The armored car based on the Reo Model F was deployed with the Machine Gun Company of the 33rd Michigan Infantry, possibly during their tour of duty on the Mexican border.

The FY15 armored-car funding was used to purchase two more armored cars. Armored Car No. 3 was based on another White 1½-ton 61-TDB chassis purchased on April 11, 1916. Rather than shorten the chassis to 132in as was done with AMC No. 2, the AMC No. 3 used a full-length 164in chassis with a longer armored body and an enlarged rear compartment. The armored body was made out of improved armored steel by the Van Dorn Iron Works instead of the flange steel used on the AMC No. 1. The turret on the AMC No. 3 was different in many details from the standard RIA type, including a new hatch design. Construction of this vehicle did not begin until May 1917 due to the various changes.

The armored motor cars built for the 1st Armored Motor Battery of the New York National Guard were constructed on different truck chassis. AMC B-1 was built on a 2-ton Mack Model AB truck chassis, as shown here at the Fort Washington Avenue Armory. This displays the special searchlight that folded up from within the engine compartment.

Armored Motor Car No. 4 was based on a Jeffery Quad chassis and was basically similar to AMC No. 1 except for the design of the hull front. The AMC No. 4 had an angled front plate compared to a near vertical plate on the AMC No. 1 and the side engine access doors were different in design. The AMC No. 4 dispensed with the fixed lights first fitted on the AMC No. 1, and this feature was later changed on the AMC No. 1 making it sometimes difficult to distinguish the two vehicles.

NATIONAL GUARD ARMORED CARS

In addition to the armored cars constructed by RIA for the Regular Army, several state National Guards obtained armored cars in 1915–16. In most cases, commercial firms donated their 1914 armor cars to local National Guard units after the European market disappeared in 1914–15. The New York National Guard (NYNG) deployed the largest single armored-car contingent, based on a mixture of local design initiatives and donated armored cars. In 1915, Captain Henry G. Montgomery came up with the idea of designing an armored truck that would be based around a standard armored body that could be fitted to various 1½-ton or 2-ton truck chassis. Wealthy New York financiers connected with the US Steel Company including Elbert Gary and Henry Frick funded Montgomery's scheme. There have been suggestions that the private support was motivated in part by the industrialists' recognition that such vehicles would be useful in suppressing the increasingly violent strikes and labor disputes that were roiling the country at the time. Three pilots were built, B-1 on a 2-ton Mack Model AB truck chassis, B-2 on a Locomobile chassis, and B-3 on a White chassis.

A fourth type, the "Revolving Turret Armored Motor Car" was eventually added to this unit from another New York firm. The Armored Motor Car Company had originally been formed in New York in November 1914 by J. H. Allen of the Elyria Iron & Steel Company. Allen planned to build armored trucks for the export market. He claimed to have a contract for 12 of these armored trucks, but apparently only a single example was built. This was assembled on a Thomas Truck Model 40 2-ton truck chassis powered by a Buda Model OU 36-horsepower engine. C. K. Thomas, formerly the vice-president of the Federal Motor Truck Company, subsequently bought the Armored Car Company of New York, and merged this with his truck company into the Consolidated Motors Company. As a result, this particular

A pair of armored motor cars of the NYNG 1st Armored Motor Battery on parade in Union Square in lower Manhattan in February 1918. In the foreground is B-2, built on a Locomobile chassis and behind it, B-1 on a Mack Model AB chassis.

The Revolving Turret Armored Motor Car was another speculative venture built in 1914 for the export market. By 1916, it was part of the new 1st New York Armored Motor Battery of the New York National Guard.

armored car has been attributed to several of these firms. The sole example of the Revolving Turret AMC was sold or donated to the NYNG in 1916.

These four armored cars were used to form the core of the 1st New York Armored Motor Battery in 1916, based at the Fort Washington Avenue Armory of the 22nd Engineers in Upper Manhattan, New York City. This unit had a peacetime complement of seven officers and 78 enlisted men. The plan was to construct 40 armored cars and 60 motorcycles with machine-gun armed side-cars. The total number of armored cars actually constructed for the unit is not definitely recorded and various histories place the number at 7 to 10. It is possible that the unit acquired additional commercial armored cars at a later date, but the records are scanty. Montgomery tried to interest the Regular Army in the armored-car battery for service in the Punitive Expedition, but transfer to federal service floundered when the National Guard troops refused to cooperate.

A number of other states received armored cars from local automobile companies that had been involved in the speculative construction effort in 1914. The Reo Motor Car Company donated their prototype Model F armored car to the Michigan National Guard, first serving with the Machine Gun Company of the 33rd Michigan Infantry, and subsequently with the Michigan State Troops Permanent Force, an organization created in April 1917 when the Michigan National Guard was federalized for service in France with the American Expeditionary Force (AEF); this was the forerunner of the later Department of State Police. The Reo F served with the 3rd Motor Troop while the other troops used six Studebaker cars that had been fitted with machine guns and armored shields. The National Defense Co of Boston built an armored car on a Reo chassis that was donated to the Machine Gun Company of the 8th Infantry Regiment, Massachusetts National Guard. Other state National Guards probably had armored cars as well, but comprehensive records are lacking.

Besides the Regular Army units mobilized for the Mexican Punitive Expedition, Wilson also mobilized the National Guard on June 16, 1916, adding about 105,000 troops to the operation. These forces were used to patrol the Mexican–American border and to defend Texan towns from

This armored car built on the Reo Model F chassis in 1914 was intended for export. It had a prominent wire cutter on the front and was armed with the .30cal Benét–Mercié M1909 machine gun with embrasures on all four sides. It is seen here on display at Camp Custer in Battle Creek, Michigan.

further Mexican raiding. The National Guard troops began to arrive in Texas in July 1916. Their armored cars were mainly used on patrols on the Texas side of the border, and there is no evidence that any of the National Guard armored cars fired their guns in anger. By late summer, it was becoming clear that so many National Guard troops were not needed. Although some units were taken into federal service, many were relieved of duty and returned to their home states. This included the 1st NY Armored Battery, which was relieved on August 10, 1916. Their armored motor cars became a popular fixture at War Bond drives in New York City in 1917–18 and so are probably the most famous American armored cars of this era.

MARINE ARMORED CARS

The US Marine Corps (USMC) purchased more armored cars than the US Army in 1916–18 due to their different mission. The Marines had staged an amphibious landing at the Mexican port of Veracruz in April 1914 during the Mexican civil war. The Veracruz landing party lacked any vehicles and after this incident, there was some interest in acquiring vehicles light enough to be deployed off craft to support future amphibious operations. The Marines turned their attention to the offerings of the Armored Motor Car Company of Detroit, Michigan (a different firm than the New York based company mentioned above in spite of the common name).

The Detroit company offered the designs of Waldo A. Ross, a British expatriate who claimed to have served with the Royal Navy Air Service's (RNAS) armored cars in Belgium in 1914 before being invalided out of service from wounds. He usually went by the title "Capt W. A. Ross." He had developed a light armored car based on a King Motor Car Company chassis fitted with ¼in armor plate. Its machine-gun turret was reminiscent in shape to the British 1914 Rolls Royce armored cars. What separated his design from similar light armored cars was that he marketed it along with a "Landing Transport" for amphibious delivery. This feature intrigued

the Marine Corps which had taken note of the RNAS actions. The Royal Navy armored-car actions in Belgium meshed closely with emerging Marine concepts for their Advance Base Force.

The Ross Landing Transport was a 40-foot boat, fitted with a unique treadmill system for propulsion. The armored car would be lowered into the boat by crane with its rear wheels fitting into the treadmill system. The rear wheels could then be used to power the boat's propeller. For the landing, the armored car carried a set of landing ramps on either side of the body that could be dismounted and used to transfer the armored car from the boat to the shore.

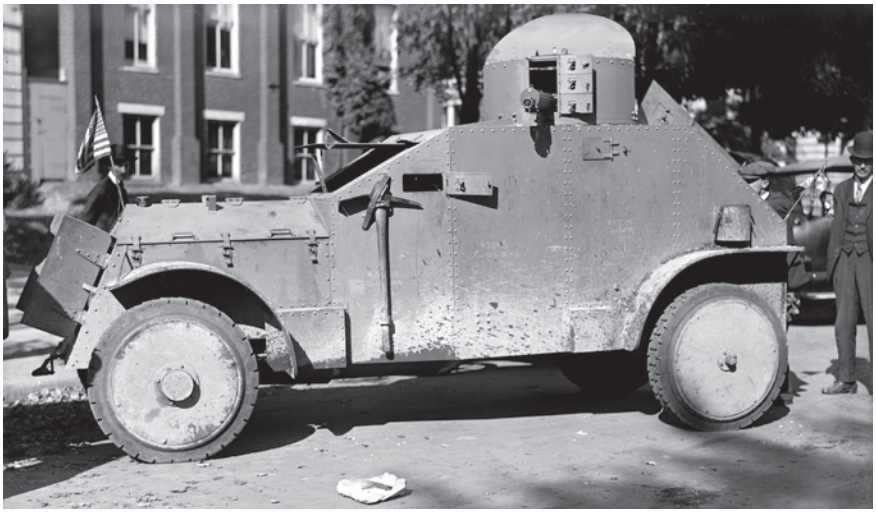
In the summer of 1916, the Quartermaster USMC secured funding to test the King armored-car pilot. The Armored Motor Car Company delivered one of their King armored cars to Fort Myer near Washington for trials by the Army's Ordnance Department. In August 1916, the Marine Corps put the pilot King armored car through extensive trials including a test of the Landing Transport. One of the officers involved was Capt Earl H. "Pete" Ellis, the legendary prophet of Marine amphibious operations in later years. One of the armored cars was driven to RIA in September 1916 for further trials that raised several concerns about some of its technical features. Based on these complaints, Ross designed an improved version, sometimes called the "King Eight." This version had a new, enlarged turret design, and the rear was reconfigured to provide more space inside the hull. The US Army ordered two of the modified versions on November 22, 1916, and they were tested alongside the White/Van Dorn Armored Motor Car No. 3 at Fort Sill. The army preferred the AMC No. 3 over the King, though in the event, no further armored cars were purchased.

In October 1916, Secretary of the Navy Franklin D. Roosevelt authorized the Marines to acquire two King Eight armored cars for a price not to exceed $5,500. Further work by Capt Andrew Drum and Pete Ellis convinced the Commandant of the Marine Corps, Gen George Barnett, to expand the fledgling Marine armored force to eight armored cars to serve as the basis for the 1st Armored Car Squadron of the Advance Force Brigade in Philadelphia. This unit did not see combat service in World War I, but the King Eight armored cars were used in various overseas deployments after the war as detailed below.

The American Expeditionary Force did not deploy any armored cars in France in 1917–18. However, the Quartermaster Corps suggested that armored cars would be valuable for convoy protection and base security and built a wooden mock-up of a suitable design in 1918.

THE GREAT WAR

The limited experiences with armored cars in the Mexican Punitive Expedition did little to encourage any large-scale acquisition by the US Army. RIA continued to test commercial designs, including one of the New York National Guard's Mack armored trucks, and the two King armored cars. The Army request for the FY17 appropriation bill anticipated the purchase of 58 armored cars but instead, most of



Even though the US Army did not procure any significant number of armored cars during the war, development continued by several automotive firms. Rock Island Arsenal built Armored Motor Car No. 3 on a White chassis in 1917 with the Van Dorn Iron Works providing the armored body. Aside from the lengthened hull, it had a modified turret compared to the earlier RIA designs. It is seen here in Washington, DC. (Library of Congress)

the funding was directed to the development costs of "tracked armored motor cars," namely the new tanks.

One of the most curious wheeled armored vehicles to emerge in 1917 was a Holt Tractor vehicle based around a three-wheel steam traction engine. Unlike agricultural tractors, the two main wheels were in the front of the vehicle and the small steering wheel was located at the rear. This unusual vehicle never received a formal designation and was variously called the "Steam-Driven 3-Wheel Monitor" or "Steam-Wheel Monitor." Holt was awarded a contract for the design on July 20, 1917. The Monitor weighed ten tons unloaded and was protected with a ⅝in boiler plate. The two eight-foot sieve-grip tractor wheels were manufactured by the Hart Parr Company and were powered by two Doble steam engines using a drive train developed by the General Engineering Company of Detroit. The principal armament was a 75mm M1916 pack howitzer, based on the Vickers 2.95in mountain gun, fitted in a ball-mount at the front of the Monitor. There were machine-gun barbettes on either side of the hull. This armament arrangement was apparently reconfigured at a later date, as a postwar Ordnance report describes the Monitor being armed with two 6-pdr guns and two machine guns. Although impressive in size, the design was mechanically feeble. During its first and only test at Aberdeen Proving Ground (APG) in 1918, the front wheel bogged down after the vehicle had moved barely 50 feet. It

B

1: HOLT STEAM-WHEEL MONITOR, ABERDEEN PROVING GROUND, MARYLAND, 1918

The 1906 War Department Circular 66 specified the use of olive drab for army wagons that was based on raw umber pigment and white lead as its primary coloring agents. This color remained standard through World War I, and was authorized in the annual editions of the "Manual for Quartermaster Corps, United States Army" through 1917. This variety of olive drab was lighter than the more familiar olive drab adopted in 1919–20 and used through World War II.

2: JEFFERY ARMORED MOTOR CAR No.1, PUNITIVE EXPEDITION, EL PASO, TEXAS, 1916

The Jeffery armor motor car was also finished in the contemporary shade of olive drab. Photographs of this vehicle show no evidence of any markings.

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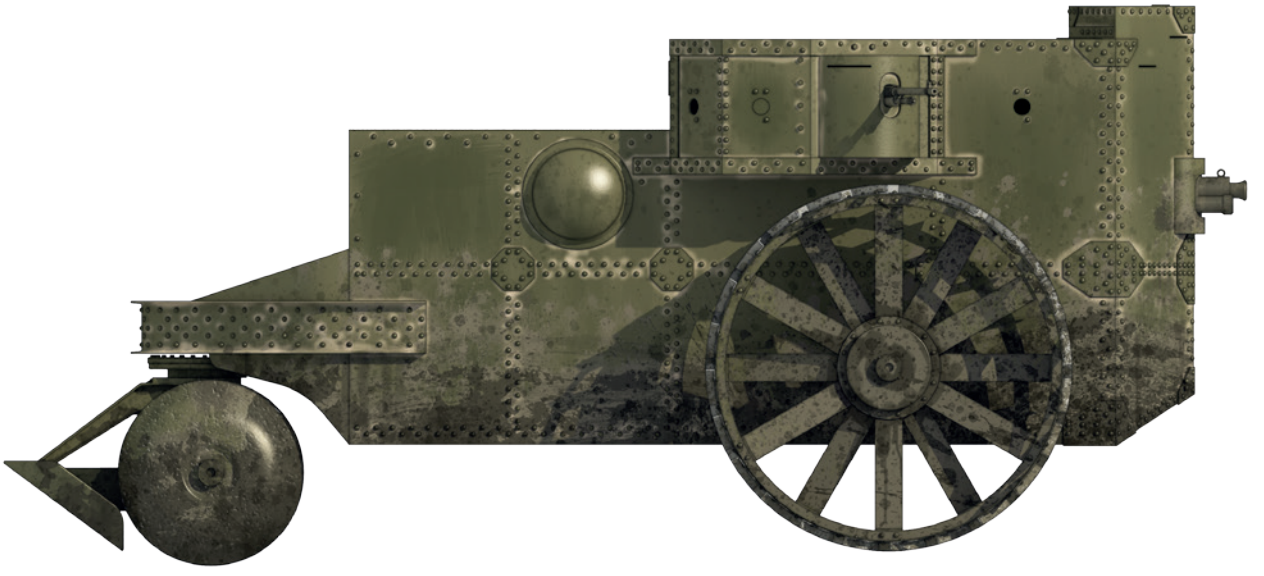

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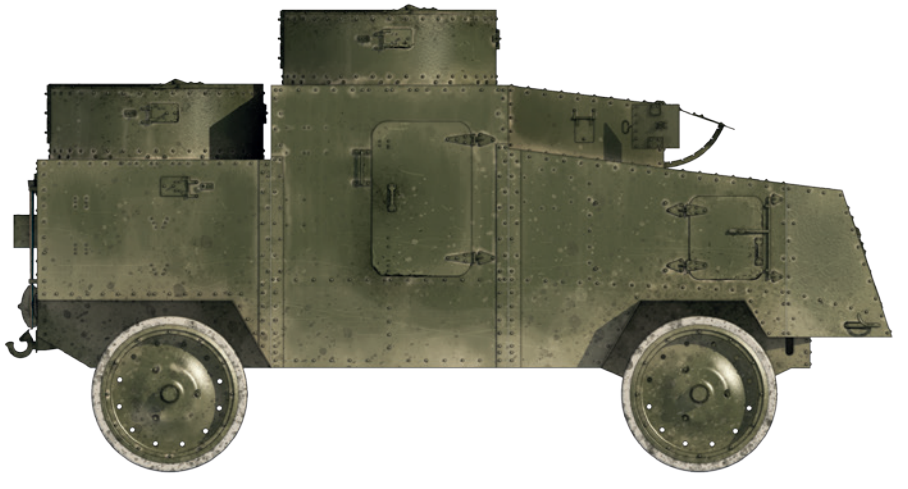


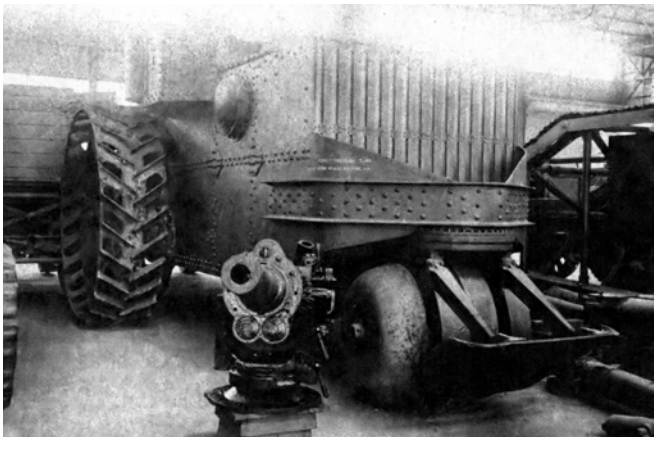
The 332nd Infantry serving on the Italian front in 1918 was supported by Italian Lancia IZM armored cars in at least one operation in November 1918. There was familiarization training beforehand between Italian and American troops at the Italian machine-gun school near Barbarano, Italy, as seen here in early September 1918.

was retired to a shed at Aberdeen and forgotten. This was the largest and heaviest wheeled combat vehicle built in the United States until the 1940s.

When the United States entered the Great War in 1917, it had only a handful of armored cars along the Texas border, a scattered assortment of types with various state National Guard units, and a few more in testing establishments. In 1917, the Allied Commission discouraged the American Expeditionary Force from acquiring armored cars since the British and French armies had found them useless for trench warfare.

Early armored cars had inherent mobility problems since they were usually built on commercial automobile or truck chassis. They had poor off-road mobility as a result of the high ground pressure of their narrow tires, worsened by the several tons of armor added to the chassis. High ground pressure meant that armored cars became quickly bogged down in soft soil such as mud, and so were road-bound for much of the war in Europe in 1914–18. Besides the problems with the narrow tires, the spring suspensions on trucks of this period were inadequate when trying to cross shell-torn terrain.

The French and British views were reflected in US Army plans, which reduced the plans for armored-car production from previous years. In testimony before Congress on January 5, 1918, the Ordnance representative, Col J. H. Rice indicated that "The armored motor car as it originally appeared in the warfare over there is a dead issue… In the early days, when there was a good deal of movement of troops, the light armored car had a place. It has no place at all in the present situation on the Western Front, and consequently we are merely making the models and being ready to build them if they want them." As a result of diminishing interest, army expenditures on armored cars nearly disappeared, with a mere $665 being spent in 1917 and $110 in 1918.



All that remains of the mysterious Steam-Wheel Monitor is this one poor image taken in 1925 at a display of World War I equipment in a shed at Aberdeen Proving Ground. This is a rear view of the vehicle and shows its large tractor wheels. The 75mm M1916 pack howitzer, seen here in the left foreground, was its principal armament along with machine-gun barbettes on either side.

The commander of the AEF, General John "Black Jack" Pershing, also had a dim view of armored cars based on his

experiences in the Mexican Punitive Expedition, and specifically denied requests to manufacture or deploy armored-car units with the AEF. In spite of Pershing's injunctions against armored cars, the US Army's Service of Supply in France recommended the acquisition of armored cars for internal security and convoy protection. A mock-up was constructed in France using wood rather than steel for the body. It remained the army's "tentative standard design" for several years after the war, although no serial production ever took place.

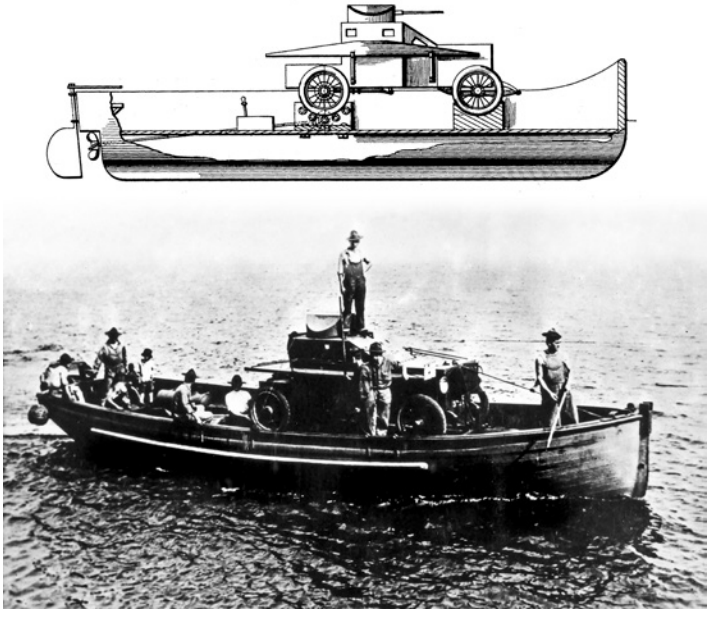
THE LEAN YEARS

At the end of World War I, the US Army had over a thousand tanks, but only a handful of armored cars. The Westervelt Board of 1918 examined future Army equipment needs and completely ignored the need for armored cars. Gen Pershing directed the Cavalry Board to conduct an investigation on "Armament, Organization, the Role of Cavalry and Cavalry Tactics" based on the lessons of the war. Since there was no American experience with armored cars during the war, the board turned to the experience of Allied armies. British use of armored cars in Palestine and Syria was noted, and the board visited the French 5e Division de Cavalerie at Vincennes. The French divisional commander enthusiastically predicted that armored cars would be the future of the cavalry. The board's report in 1919 recommended the adoption of an American armored car patterned on the French designs with a 37mm or 47mm gun. However, the report also noted the British argument that favored the use of a light cavalry tank instead of armored cars as it gave better cross-country performance.

Maj George S. Patton penned an article for the January 1924 issue of "The Cavalry Journal" that argued for a light armored car for the cavalry with the accent on speed over armor or firepower. In a later report on the tactical employment of armored cars, Patton wrote that "If the armored car degenerates into a perambulating source of firepower, it has belied its cavalry birthright. Movement, not fire, is its primary weapon." In the event, a lack of vigorous cavalry support and a lack of funding meant that there was virtually no armored-car development by the US Army for nearly a decade after the Great War.

OVERSEAS ADVENTURES

The US Marine Corps had acquired the King Eight armored cars because of their value in overseas deployments. In 1921, the 1st Armored Car Squadron was part of the 1st Advance Base Force that was deployed to Hispaniola for duty on Haiti and Santo Domingo to deal with local troubles. The armored cars were in poor mechanical condition and the engines quickly overheated in the tropical conditions, forcing the crews to operate them without their armored engine covers. With no spare parts available in the Caribbean, the armored cars became decrepit; the squadron was disbanded on May 4, 1921. Five armored cars remained on Haiti at least until 1927 before returning to the Marine barracks in the Philadelphia navy yard. Some were modernized late in the 1920s with new wooden wheels, but their technical condition



The US Marine Corps selected the Armored Motor Car Company's King armored car due to its suitability for amphibious operations. This montage shows the Ross patent drawing for his Landing Transport above, and a photo of the trial of the pilot of the King armored car on the Landing Transport on Chesapeake Bay in September 1916.

remained poor. In May 1927, the Marine Corps Expeditionary Force, China, requested that armored cars be dispatched to reinforce the China garrison. The King armored cars were so unsatisfactory that instead a platoon of Six Ton Tanks was borrowed from the Army for the China mission. The King armored cars were finally authorized for disposal in 1934. Marine detachments overseas continued to request armored car support, for example requesting the dispatch of three armored cars to the Philippines in 1938. However, the Marine Corps budget did not permit such luxuries and no replacements for the King armored cars were forthcoming.

A similar problem afflicted US Army units deployed overseas. The 15th Infantry Regiment, protecting the concession at Tientsin (Tianjin) China, was unable to obtain armored cars to help patrol the city. As a result, in 1932–33, Capt Paul Leiber designed an armored car based on available Class B trucks. Two of these were constructed at a local Chinese iron works. Although they could be armed with four machine guns and rifles, as often as not they were used to rescue missionaries and other civilians trapped by irate Chinese citizens throwing stones. Local American consular officials warned the garrison not to overreact to the Chinese actions, and the armored cars provided a method to carry out their missions without resorting to gunfire.

The US Marine Corps deployed their King Eight armored cars to the Caribbean in 1921 and they were involved in peace-keeping operations on Haiti. A single example remained at the US Army Ordnance Museum at Aberdeen Proving Ground for many years, and recently was restored for display at the US Marine Corps Museum near Quantico, Virginia. (Art Loder)

The US Army's 15th Infantry garrison in Tientsin, China constructed two armored trucks on Class B trucks at a local Chinese iron works in 1933. They were painted with a disruptive pattern of rectangles to hide the actual location of their view slits and firing ports.

CAVALRY MECHANIZATION

In 1927, Secretary of War Dwight Davis witnessed Britain's Experimental Mechanised Force at Aldershot during an official visit to the UK. On his return, he instructed the US Army to conduct a similar exercise, and this began in the summer of 1928 at Camp Meade, Maryland. This revived interest in armored cars for the cavalry, primarily to conduct reconnaissance. On February 15, 1928, the War Department formally organized the first Regular Army armored-car unit with the First Cavalry Division at Fort Bliss, designated as the Provisional Platoon, 1st Armored Car Troop.

The intention was to create an armored-car squadron for each cavalry division for a total of 13. Each squadron consisted of a headquarters, HQ troop and three line troops each with 12 armored cars for a total of 36 per squadron. However, because of a lack of funding and lack of armored cars, only two squadrons were activated and these had only a single active troop.

The 2nd Armored Car Squadron was formed in September 1928 for the 2nd Cavalry Division. The active element of this squadron, Troop A, 2nd Armored Car Squadron, had a convoluted career, being used by the Experimental Mechanized Force at Fort Eustis, Virginia, in 1930–31. It disappeared in 1932–33 after its equipment was absorbed into the new 7th Cavalry Brigade (Mechanized). As a result, only Troop A, 1st Armored Car Squadron remained active in the Army order-of-battle from 1928 to 1939. The 3rd Armored Car Squadron was organized as a Regular Army Inactive formation with only a skeleton structure and no equipment. In 1935, the cavalry proposed activating seven more armored-car

The T1 light armored car was a simple modification of a Pontiac automobile with the added protection of an armored windshield and armored cover over the radiator. The original configuration was fitted with two .30cal light machine guns, front and rear.

In 1932, the Pontiac T3 light armored car was modified by removing the rear machine-gun pintle to make room for an SCR-163A radio transceiver as seen here. It was redesignated as the T1 Scout Car.

troops in the Regular Army and National Guard, but, as will be discussed later, the cancelation of armored-car programs in 1937 put an end to this expansion.

The two active armored-car troops in the late 1920s were usually understrength and consisted of three platoons with a total of eight armored cars; personnel strength was two officers and 50 men each. Since no armored cars were available in 1928, the Provisional Platoon, 1st Armored Car Troop built a few "imitation armored cars" on Dodge 1-ton and Acme 1-ton truck chassis for training.

In 1928, the Rock Island Arsenal began development of both a light and a medium armored car. The T1 light armored car was built by RIA on a Pontiac Motor Company commercial automobile chassis with a 57hp engine. The T1 was not an armored car in the contemporary sense, since its protection was limited to an armored plate over the radiator and an armored shield in place of the usual windshield. It was armed with two .30cal machine guns. This offered an extreme example of Patton's recommendation for a very light and mobile armored car.

The original LaSalle T2 medium armored car was an unsophisticated design with a simple structure. The armored roof folded into the insides of the fighting compartment. It was armed with a pintle-mounted weapon in the fighting compartment, in this case, an air-cooled .30cal M1918 machine gun. This is the second pilot and it is seen here after its deployment with Troop A, 1st Armored Car Squadron.

The Army designation practice emerging at this time was to identify a test vehicle starting with a T (Test) prefix. Variations of the basic design could be further identified by an E (Experimental) suffix such as T1E1. Finally, when the vehicle was standardized for army use, it was given an M prefix such as M1. The system was confusing since many weapons would receive the same T1 or M1 designation. For proper understanding, the designation

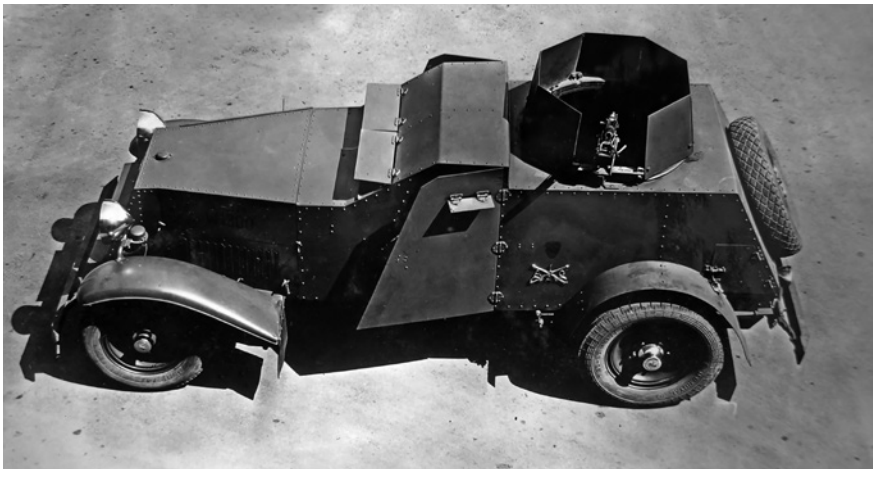
had to be employed along with the class of weapon such as M1 medium armored car or M1 rifle.

Medium Armored Car T2 was built on a Cadillac LaSalle automobile chassis with a 60hp engine. This was a fully armored vehicle weighing 4,850 pounds. There were folding panels to cover the roof, but in practice these were left open to permit the use of the vehicle armament. The vehicle weapon was mounted on a pedestal in the rear fighting compartment. Of the four original vehicles, two were armed with .30cal light machine guns, one with a .50cal heavy machine gun and one with a combination mount consisting of a 37mm M1916 gun with coaxial .30cal machine gun.

A LaSalle T2E1 armored car serving with Troop A, 2nd Armored Car Squadron during the Experimental Armored Force maneuvers at Fort Eustis in 1931.

In August 1928, the crews of the Provisional Platoon picked up two T1 light armored cars and four T2 medium armored cars in Harrisburg, Pennsylvania, and drove them to Fort Leonard Wood to take part in the maneuvers by the newly formed Experimental Mechanized Force. The November 1928 report by the 1st Cavalry Division Board at Fort Bliss favored the T2 medium armored car over the T1 light armored car. In the wake of the initial Experimental Mechanized Force maneuvers, the T2 medium armored car went through evolutionary development. The T2E1 of 1930 introduced an open-top turret and the T2E3 was a redesign to lower the overall height of the vehicle.

The cross-country performance of the T1 light armored car was inadequate because of high ground pressure and, as a result, RIA built a modified version in 1932 with thicker armor plate and larger tires, originally called the T3 light armored car. By this stage, the Cavalry was beginning to recognize that two different types of wheeled armored vehicles were



The T2E2 variant aimed at reducing the height of the series by lowering the rear roof as seen in this overhead view.

A line-up of first Regular Army armored-car unit, the Provisional Platoon, 1st Armored Car Troop. At the left are two Pontiac T1 light armored cars, in the center is a T2E1 armored car and a T2E2 to its right, and at the extreme right is one of the so-called "imitation armored cars" built by the platoon in 1928 on an Acme 1-ton truck as a substitute until actual armored cars became available.

needed: a light armored scout car for uncontested shallow reconnaissance and liaison missions, and a better-protected armored car for contested deep reconnaissance missions. As a result of this change in doctrine, the T3 was redesignated as the T1 scout car. In practice, the armored cars were assigned to the armored-car squadrons of the cavalry divisions while the scout cars were assigned to the cavalry regiments.

THE QUARTERMASTER ARMORED CARS

Besides the armored cars developed by Ordnance at Rock Island Arsenal, the Quartermaster Corps (QMC) at the Holabird Depot in Maryland also became involved in armored-car design in the late 1920s. Organizational responsibility for armored-car development was ambiguous. Ordnance was the recognized authority for tracked combat vehicles. It had been involved in the earliest armored-car designs from 1915, but had shown little interest in the concept since 1918. The Quartermaster Corps was responsible for tactical vehicles and saw armored cars falling under this category since they

C

1: T7 ARMORED CAR, TROOP A, 2ND ARMORED CAR SQUADRON, EXPERIMENTAL MECHANIZED FORCE, FORT EUSTIS, 1931

After World War I, the US Army decided to adopt a color specification that could be issued to industry for the formulation of commercial paint rather than having units mix their own paint as had previously been the case. On November 28, 1919, the Quartermaster Corps released Specification 3-1 which depicted olive drab as one of 24 standard colors for US Army use. Some accounts indicate that the Quartermaster Corps derived it from the commercial Panama Pullman Green railroad color. The Spec. 3-1 olive drab was a darker shade of olive drab than the wartime Quartermaster color, and would remain the standard for olive drab through World War II. Through the inter-war years, US Army armored vehicles officially were finished in the same lusterless (flat) olive drab. However, in practice, they were usually finished in a gloss version of this paint.

Unit markings at the time were prescribed in Army Regulation AR 850-5. This consisted of the cavalry crossed sabers as the branch insignia, the squadron number above and the troop number below. Cavalry units often used chrome yellow for these colors rather than the more common white, presumably because this was the branch color. In 1929, the US Army Quartermaster Corps adopted a formal pattern of vehicle registration numbers, painted in black, the "W" indicating War Department. In the case of this vehicle, the number was repeated on the upper right corner of the rear superstructure.

2: T2E1 ARMORED CAR, TROOP A, 2ND ARMORED CAR SQUADRON, EXPERIMENTAL MECHANIZED FORCE, FORT EUSTIS, 1931

This T2E1 armored car follows the same color and markings of the T7, namely overall olive drab with the unit insignia in chrome yellow and the registration number in black.

2
A
C
A
2ND CAVALRY DIV.

1

2
A
C
A
2ND CAVALRY DIV
USA W1314

2

2
A
C
A
2ND CAVALRY DIV
USA W1300

The six Franklin T7 armored cars built at the Quartermaster's Holabird Depot served with Troop A, 2nd Armored Car Squadron during the maneuvers of the Experimental Mechanized Force at Fort Eustis in 1931. They had two .30cal machine guns in the hull, fore and aft, and a water-cooled .50cal heavy machine gun in the turret.

were essentially tactical vehicles with an armored shell. The controversy over control of armored cars raged for about five years.

The QMC armored-car effort was part of a broader standardization effort by the new head of the QMC, Gen John DeWitt. Rather than acquire completed vehicles from industry, DeWitt favored the acquisition of major sub-assemblies such as engines, transmissions and frames from the automobile industry and assembling complete vehicles at the Holabird QMC Depot.

DeWitt's standardization policies were vociferously rejected by Chief of Ordnance, Gen Samuel Hof, who argued that the American automotive industry could offer superior products to the slap-dash designs being cobbled together at the Holabird QMC Depot. Although Ordnance acknowledged that the QMC had responsibility for army tactical vehicles, armored cars were viewed as part of Ordnance's realm.

The QMC planned to develop a family of standardized armored cars based on components being acquired for the QMC military trucks. The T7 medium armored car, often called the Franklin Armored Car, was built in 1929 on a 4x4 chassis using a Franklin 95hp engine. It was armed with a water-cooled .50cal machine gun in a fully enclosed turret, and two .30cal air-cooled machine guns protruding from the right front of the driver's compartment and the rear of the hull. On at least one occasion, the T7 was fitted with two additional Lewis machine guns on pivoting mounts on

The T6 was a reconstruction of one of the T7 medium armored cars with a reconfigured hull and new turret shape. It served with the 1st Cavalry (Mecz) at Fort Knox.

the hull side. The T7 was one of the few Holabird designs manufactured in any quantity, with six completed. A single T7 armored car was rebuilt in 1932 with a substantially modified hull; confusingly it was designated as the T6 armored car even though it followed the T7 design.

Holabird also built a trio of small, sleek armored cars very similar in design except for their automotive chassis. Two T8 armored cars were built in 1930, powered by a 46hp Chevrolet engine. They were armed with a single .30cal machine gun in a rear turret. The T9 armored car was built in 1930 and was essentially the same as the T8 except for its use of a Plymouth automobile chassis. The T10 was the third of these small Holabird armored cars, with three built on Willys-Overland chassis with modest 19hp engines.

One of the two Chevrolet T8 light armored cars built at the Holabird Depot. This photo was taken when the vehicle was part of Troop A, 2nd Armored Car Squadron during the maneuvers of the Experimental Mechanized Force at Fort Eustis, Virginia in 1931. The T8, T9, and T10 armored cars were all very similar except for the chassis and engine.

The QMC armored cars were deployed with the newly formed Troop A, 2nd Armored Car Squadron. This unit took part in the next phase of exercises by the Experimental Mechanized Force at Fort Eustis, Virginia, in the summer of 1931.

The QMC's assertive manufacturing policies came under increasing scrutiny from government agencies, prodded by the US automobile industry. The government's Comptroller General, J. R. McCarl, concluded that the QMC policy excluded competition in government contracting, a violation of existing practices. In September 1933, the Army Chief of Staff, Gen Douglas MacArthur, settled the matter by issuing General Order No. 9 which formalized McCarl's ruling. This ended the QMC attempts to build armored cars in favor of the Ordnance Department monopoly.

An interesting overhead view of the T10 light armored car built on a Willys-Overland Whippet chassis. This provides a good impression of the layout of the vehicle as well as showing the large floatation extensions on the wheels that were tested with this armored car in the hopes of improving cross-country travel in soft ground conditions.

An M1 armored car of the 1st Cavalry Regiment. The mediocre cross-country performance of these vehicles in the 1936 summer maneuvers undermined the cavalry's faith in wheeled armored cars for deep reconnaissance.

THE M1 ARMORED CAR

The Experimental Mechanized Force maneuvers made it clear that medium armored cars needed lower ground pressure and a better suspension to operate effectively off-road. James Cunningham and Sons hired a former Pierce Arrow engineer, David Fergusson, who developed a four-wheel articulating bogie system for the rear wheels. This system served as the basis for the T4 medium armored car, also designed by Fergusson. The T4 armored car was fitted with a fully enclosed turret, developed in conjunction with Rock Island Arsenal. The turret was armed with a T5 combination gun mount consisting of a .50cal M1921 heavy machine gun and a coaxial .30cal M1918 light machine gun. At the time, the .50cal heavy machine gun was considered the best available light antitank weapon since it had much better armor penetration than the old 37mm tank gun based on the Hotchkiss pattern. For antiaircraft defense, the turret had two bracket mounts on the roof for use with a .30cal machine gun. The construction of this turret was unusual. To permit ventilation, it was fitted with a mushroom cover that provided air circulation under the periphery while at the same time preventing hostile fire from entering the turret.

After trials at Aberdeen Proving Ground, the two Cunningham T4 pilots were sent to the Cavalry Board at Fort Riley, Kansas and then issued to Troop A, 1st Armored Cavalry Squadron at Fort Bliss, the former "Provisional Platoon." This was the first US Army armored car to be accepted as standard, and was designated as the M1 armored car in 1933. A total of 12 of these were funded in Fiscal Year 1932 and eight in FY33 for a total of 20. Most of these were assembled at RIA in 1933. The plan was to equip each of the two armored-car squadrons with 36 armored cars, but manufacture during this period was far too modest to accomplish this, largely due to the crippling financial effects of the Great Depression.

Armored Cars: Comparative Technical Characteristics

Designation	T9	T7	M1	T11E1
Crew	3	4	4	4
Length (in)	156	166	180	183
Width (in)	68	69	72	79
Height (in)	69	92	83	88
Weight (tons)	1.8	3.6	5.1	6.45
Horsepower	50	95	133	118
Speed (mph)	60	60	55	48

D

M1 ARMORED CAR, TROOP A, 1ST ARMORED CAR SQUADRON, 1ST CAVALRY, FORT KNOX, 1937

This M1 armored car followed the usual markings practices of the time, with the AR-850-5 pattern of unit insignia, a chrome-yellow crossed-sabers marking with the squadron number above and troop letter below. This is amplified by the unit identification on the bumper in white. This vehicle also carries the regimental insignia for the 1st Cavalry, the Black Hawk insignia commemorating the regiment's role in the 1832 Black Hawk war. On the lip of the turret is a brass plaque with the cavalry's crossed-saber emblem.

LAST OF THE ARMORED CARS

In 1931, the Mechanized Development Board recommended that the Experimental Mechanized Force be constituted as an integral part of the Regular Army including a Cavalry Armored Car Detachment. The traditional combat arms such as the Infantry and Cavalry opposed this plan, seeing this as the first step in the creation of a rival combat branch. In the event, the new Army Chief of Staff, Gen Douglas MacArthur, disagreed with the recommendation. Instead, in May 1931, he authorized both the infantry and cavalry branches to begin to mechanize rather than to create a separate mechanized force. MacArthur's new policy spurred on the mechanization of the cavalry, but did not necessarily favor armored-car development. Instead, it created a new rival to the armored car.

MacArthur's decision undermined the restrictions against the cavalry's acquisition of tanks that had been embodied in the 1920 National Defense Act. The new mechanization plan skirted around the legislative restrictions by the fig-leaf of terminology, calling cavalry tanks "Combat Cars." The Cavalry had already recommended the acquisition of the Christie M1928 convertible tank, and the emphasis in cavalry mechanization began shifting away from armored cars to the combat cars. The combat car program is described in more detail in the first volume of this series on tanks.[1]

The Cavalry's new emphasis on combat cars had an immediate and unfavorable impact on the funding for armored cars. The army budget saw little growth during this period, because of the lingering effects of the Great Depression. The Army's funding for mechanization procurement in Fiscal Year 1933 was $375,000 with $175,000 going to armored cars and the rest to tanks. But in Fiscal Year 1934, only $75,000 went to armored cars out of the total procurement budget of $395,000 since $220,000 was now being spent on the first series production batch of combat cars. Funding for research and development also fell from $50,000 for armored cars in Fiscal Year 1933 to only $40,000 in Fiscal Year 1934.

1 Steven Zaloga, *Early US Armor: Tanks 1916–40*, Osprey New Vanguard 245 (2017)

The Front-Wheel Drive T11 medium armored car was fitted with a steel castor wheel between the two main wheels to prevent the chassis from bogging down. This was replaced by spare tires on the T11E1 production version.

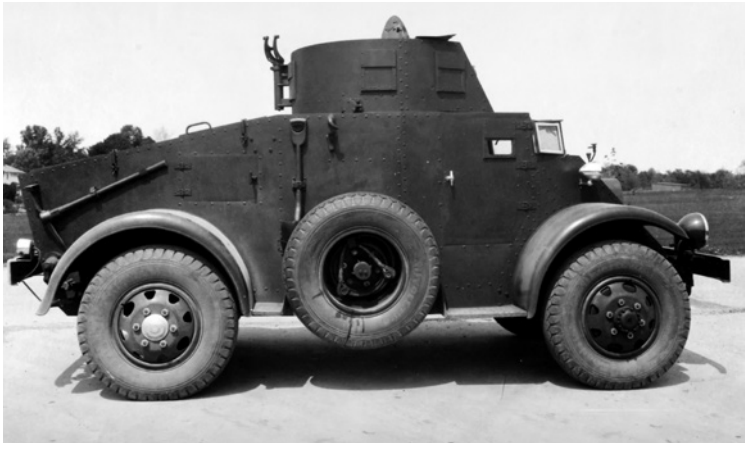
The last armored car developed by Ordnance before World War II was the T11. Development of this 4x4 design began in 1932 by the Four-Wheel Drive Automobile Company of Clintonville, Wisconsin, manufacturers of the famous Front-Wheel Drive (FWD) trucks. This armored car was fitted with a standard RIA turret with a T7E1 combination mount with a .50cal M1921 machine gun, coaxial .30cal M1918 machine gun and telescopic sight. There was also a 6in ball-mount in the hull front for another .30cal machine gun. The pilots were used for operational trials with the 1st Armored Car Squadron during the Fort Riley maneuvers in the summer of 1934 where they performed well.

The Marmon-Herrington T11E1 medium armored car can be distinguished by the spare tires carried on the center of the sides. This one was assigned to the 1st Armored Car Troop of the 1st Cavalry Division at Fort Bliss. The usual turret armored cover has been removed to give the turret crew some relief from the hot Texas sun.

Although the Cavalry generally preferred the overall design of the T11 over the existing M1 armored car, several technical problems were uncovered during testing at APG including a weak rear suspension and faulty engine cooling. After these problems were rectified, Ordnance put out a request for bids for the manufacture of six improved T11E1 armored cars. The original T11 had a set of caster wheels on the hull side between the main wheels to prevent bottoming out, while the new T11E1 had spare tires instead.

A new military truck firm, Marmon-Herrington, was formed in 1931 by Walter Marmon and Arthur W. Herrington. The formation of this firm was one of the consequences of the feud between the QMC and Ordnance. Herrington had been an engineer serving with the Quartermaster Corps at the Holabird depot, designing their standardized trucks, and left the service when the QMC was pressured to abandon the design of their own trucks in favor of acquiring available commercial trucks. When the Army put the T11E1 contract out for bid, Marmon-Herrington put in a bid that was several thousand dollars lower than the Front-Wheel Drive bid. It later became apparent that the Marmon-Herrington bid was in fact below cost, and intended to give the company an initial toe-hold in army procurement.

In the event, the army accepted Marmon-Herrington's low bid despite the new firm's complete lack of experience in this field. FWD refused to work with the army for many years afterward because they felt the choice had been made due to cronyism among present and former army employees. Marmon-Herrington produced the six T11E1s in 1935 and they were all issued to the 1st Armored Car Troop of the 1st Cavalry at Fort Bliss, Texas. A final vehicle was built in the T11E2 configuration in 1936. This used a new turret patterned on the type used on combat cars. In addition, the Hercules WXLC3 replaced the earlier Cadillac V-8 engine used with the T11 and T11E1. Although the new powerplant improved torque and low-speed acceleration, the vehicle suffered from poor engine cooling and only a single pilot was completed. Ordnance drew up a plan for a half-track armored car called the T12, but this did not progress to assembly.



The T11E2 medium armored car introduced a new turret design. The substitution of a Hercules WXLC3 engine led to a reconstruction of the rear engine compartment, but did not cure the vehicle's cooling problems.

The army's 1935 5-year mechanization program included expanded armored car procurement to permit the formation of seven more armored-car troops, starting in 1936 with three for the Regular Army and four for the National Guard. During the 1936 maneuvers, the off-road capabilities of the cavalry's M1 armored cars proved to be poor. The Chief of Cavalry recommended abandoning the plan to organize and equip seven armored-car troops. The lighter scout cars, described below, had proven to be more than adequate for the reconnaissance needs of the cavalry regiments. The new combat cars had been found to be much more effective for the long-range reconnaissance needs of the cavalry divisions, the traditional role for the armored cars. Another important consideration was cost. The combat cars were not that much more expensive than armored cars: in 1935 an armored-car troop cost $295,550 compared to $348,450 for a combat car troop. As a result, the Chief of Cavalry recommended that the scout car become the standard cavalry wheeled armored vehicle and be substituted for armored cars and half-track cars. On January 14, 1937, Ordnance canceled all requirements for further armored cars in favor of scout cars. The armored-car designation was eliminated from the Book of Standards; development of armored cars did not resume until 1941.

THE TUCKER TIGER TANK

The eccentric automobile designer, Preston Tucker, designed his exotic Tucker Tiger Tank with a 37mm automatic cannon in a "bullet-proof" plexiglass turret and a purported road speed of over 100 miles per hour.

One of the last armored cars examined by the US Army before World War II was the exotic "Tucker Tiger Tank" promoted by the eccentric automobile designer Preston Tucker. He had collaborated with the well-known automotive designers Harry A. Miller and Wesley Casson to develop this armored car. The prototype was manufactured by the American Armament Company at its Rahway, New Jersey, factory, best known for its aircraft gun turrets. The Tucker Tiger Tank's unique feature was its turret, made from laminated bullet-resistant glass 2¾in thick and armed with a 37mm automatic cannon. This resembled an aircraft machine-gun turret rather than a

conventional armored car turret. Besides the turret armament, there was a .50cal heavy machine gun in the center of the hull front, and two more .30cal machine guns on the front corners. The hull was constructed from conventional steel armor ranging from 7 to 14mm thick. It was powered by a 175hp Packard engine, which Tucker claimed would offer a top speed of 114mph. The APG tests reached 74mph but the army report admitted that they had not fully opened the throttle. The Tucker Tiger Tank was tested at Aberdeen Proving Ground for two weeks in November–December 1938. The report indicated that the speed, power, and riding qualities were superior but that the 4x2 configuration with only one set of powered wheels was unsatisfactory, especially when operating in sand. Ballistic tests against the glass turret were inconclusive, but APG recommended that the concept of bullet-resistant glass was of "exceptional merit," requiring further scrutiny. After being rebuffed by the US Army, Tucker began a major promotional campaign in the automotive press portraying the Tucker Tiger Tank as a futuristic design that would rule the battlefield. He tried to drum up political support for his design with various American politicians without notable success, and also attempted to interest the Dutch Army. In the event, only a single prototype was built.

TRACKED AND HALF-TRACK ARMORED CARS

The US Army was intrigued by the idea of substituting a tracked unit for the rear wheels on trucks to improve their cross-country performance. There were two configurations of these "half-track" suspensions. Mack Truck in the early 1920s demonstrated a set of temporary tracks that could be placed around the double rear wheels of larger trucks when ground conditions were poor, such as snow or mud. Several firms manufactured this type of track for commercial use and in 1933 the cavalry tested the Chase track on the M1 medium armored car.

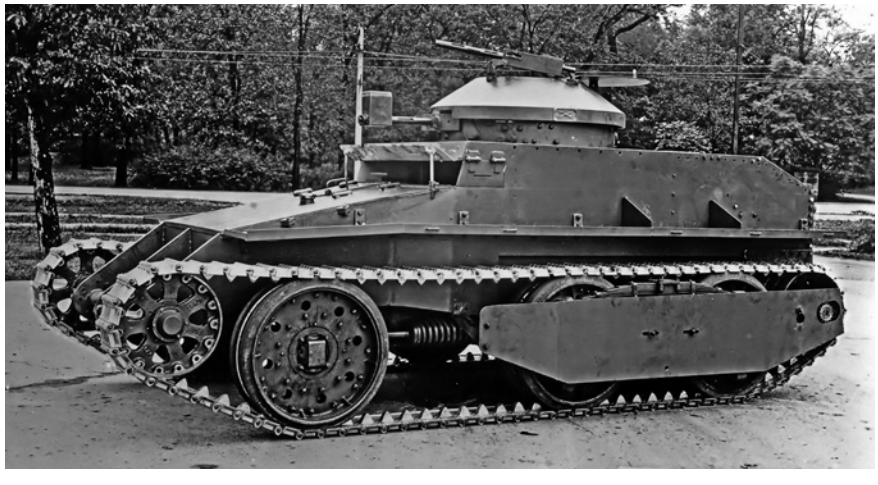
The other suspension configuration was a dedicated half-track design with a powered drive sprocket to improve traction. The US Army tested the French Citroën-Kégresse suspension on a truck in 1925. These were intended mainly as prime movers for artillery. David Fergusson of James

The cavalry experimented with early half-tracks as a possible solution to the limited cross-country mobility of wheeled armored cars. A total of 20 M1 half-track cars were acquired and mainly used as cavalry machine-gun carriers as is the case with this vehicle of the 1st Cavalry (Mecz) at Fort Knox.

Cunningham and Sons developed an indigenous design and this served as the basis for a Cunningham half-track. Cunningham manufactured 20 of these under an Ordnance contract as the T1 Half-Track Car. These went through operational trials with the cavalry and gradually evolved into the T1E1 and T1E2 designs at Rock Island Arsenal. RIA assembled 30 T1E2s from Cunningham components and the cavalry used these as machine-gun carriers to transport dismountable machine gun teams. They were belatedly standardized as the M1 half-track car in March 1939. The cavalry did not purchase any further half-tracks in the late 1930s due to a shortage of funds, but the idea remained active and would have significant repercussions in 1939–40.

As mentioned earlier, the cavalry's attitude towards fully tracked vehicles was distorted by the 1920 National Defense Act. This legislation allotted all tanks to the infantry, preventing the Cavalry from acquiring tanks. Growing interest in mechanization in the late 1920s led to some efforts to skirt around the restrictions. Demonstrations of the Christie M1928 convertible tank drew considerable cavalry interest since its high speed and mobility seemed ideal for the cavalry role. In 1929, the Army's Adjutant General permitted the Cavalry to request the acquisition of a single Christie tank in an armored car configuration for operational trials. As recounted in the previous "Tank" volume of this series, this request became hopelessly entangled in disputes between the cantankerous J. Walter Christie and his foes in the Ordnance Department. As a result, Ordnance instructed RIA to develop the T5 convertible armored car in 1931. As in the case of the Christie tank, the T5 could run either on its wheels, or on tracks. MacArthur's May 1931 mechanization edict had immediate effects on the T5 convertible car program. The T5 had its designation changed to the T2 Combat Car. Although development continued, this design lost out to its competitors, first to the Christie T1 Combat Car, and later to the improved Rock Island Combat Car designs.

In 1933, J. Walter Christie offered the Army a modified version of the M1928 called the M1933 Airborne Combat Car. This had the convertible wheel/track system removed and was fitted instead with only four wheels. By this stage, Christie had alienated the Ordnance Department, and no attention was paid to his offer.



The T5 convertible armored car was a short-lived attempt by Rock Island Arsenal, inspired by the Christie tank, to develop an armored car that could be operated either on tracks or on wheels. It shared a common turret with the M1 armored car. This is its original configuration in September 1931.

EXPORT ARMORED CARS

A rear view of the American LaFrance TK-6 armored car built for the Persian Gendarmerie in 1933 while on trials at Aberdeen Proving Ground in August 1933. In this view, the turret is pointed towards the rear. This armored car had dual driving controls so that it could be driven from the front or rear.

American automotive firms sold automobiles and trucks to several armies in the 1920s and 1930s, and occasionally received requests for the sale of armored cars. In the early 1930s, American LaFrance Company received a request from the government of Persia (Iran) for the sale of armored cars for their Gendarmerie. The firm developed the TK-6 heavy armored car armed with a combination mount with 37mm gun and machine gun in the turret and a pair of machine guns on either side of the front superstructure. These were deployed with the Gendarme Intervention Brigade with a nominal strength of four motorized Gendarme companies, each with a platoon of 12 TK-6 armored cars. It is not clear how many TK-6 armored cars were delivered to Persia. At least one TK-6 was retained in the United States and sent to the US Army for trials in 1933. It is interesting to note that the TK-6 had rear-driving capabilities, a feature lacking in armored cars built for the US Army at this time.

The Marmon-Herrington Company had an active overseas sales campaign for their trucks, and also offered a variety of armored-car designs and light tanks. After selling trucks to the Persian army in 1933, they offered the TH310 ALF-1 4x4 armored car in 1934, based on a Persian army requirement for the new armored brigade stationed with the central garrison in Tehran. At this stage, Marmon-Herrington had little experience in the design of turrets. The Persian army selected a Swedish Bofors turret, similar to the one used on the Swedish L-181 armored car, but with a short 37mm gun instead of the usual Madsen 20mm automatic cannon. A total of one pilot and 11 production vehicles were manufactured for Persia, but without turrets. They were delivered to Bandar Shahpur on the Persian Gulf where the Bofors turrets were added after the vehicles arrived. The TH310 served with the armored car battalion of the Tehran armored brigade.

The Marmon-Herrington TH310 ALF-I during trials at Aberdeen Proving Ground in May 1934. Like the American LaFrance TK-6, it was designed with dual controls for driving from either the forward or reverse stations. Marmon-Herrington had no experience in designing turrets at this stage, and the pilot vehicle had a surrogate dummy turret to mimic the actual weight balance.

THE RISE OF SCOUT CARS

The scout car concept took several years to mature. The initial Pontiac T1 Scout Car was followed in May 1932 with the Chevrolet T2 Scout Car. This was essentially similar in concept, and consisted of a Chevrolet Phaeton with an armored windshield, an armored cover over the radiator, and a pintle mount for a .30cal machine gun. Although it had wider tires than the civilian automobile, it had very limited off-road mobility.

The Indiana Motortruck Company design, based on their Model 12x4 truck chassis, was selected for the T7 requirement. It was subsequently standardized as the M1 Scout Car. The M1 Scout Car was substantially larger and more robust than previous scout car designs and had bracket mounts and pedestal mounts for machine-gun armament. This was the most widely produced US wheeled armored vehicle of the 1930s.

The two next efforts, the T3 and T4, were paper designs and never built. The T5 Scout Car was a paper design based on the T1 Half-Track Car, and never completed. The T6 Scout Car was another half-track design with turrets, but also failed to reach the pilot stage. By 1934, the cavalry had lost confidence in the idea of a weakly armored automobile and desired better overall protection.

The next scout car, the T7, proved to be the most successful of the mid-1930 designs. The T7 was designed and manufactured by a White subsidiary, the Indiana Motortruck Company, and was based on one of their 1½-ton, four-wheel drive trucks. In contrast to the earlier scout cars, it had armor protection on all sides, though the top remained unprotected. Frontal armor was ½in while the sides had ¼in and the rear had 5/16in. The armament was usually a .50cal heavy machine gun and two .30cal light machine guns. There was a heavy M4 pedestal mount on the right side running board, usually used with the .50cal heavy machine gun. In addition, there were M4 and M5 bracket mounts on the rear doors on both sides for the .30cal machine guns. Many vehicles had a bracket mount or pedestal mount fitted centrally on the rear. Tripods were stowed externally, and could be used with the machine guns for dismounted actions. Marmon-Herrington offered a similar scout car design in competition, but the T7 was selected for further development. A large cabinet was fitted behind the front row of seats for the vehicle's radio transceiver.

After the trials ended in November 1934, on December 5, 1935 the definitive version of the T7 was accepted for service as the M1 Scout Car. A total of 78 were manufactured in 1935–36, enough to equip the 13 active cavalry regiments with a scout car platoon of six scout cars each. These versatile vehicles were used by the cavalry both for reconnaissance and as command/radio vehicles. Scout cars were first demonstrated during the 1936 summer maneuvers. They conducted their reconnaissance missions unseen

E

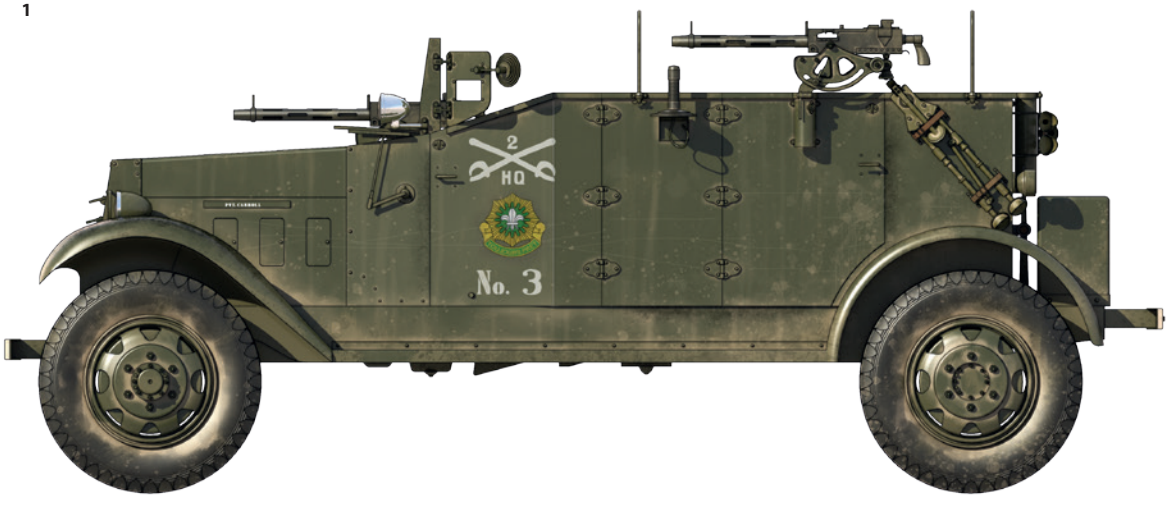
1: M1 SCOUT CAR, HQ TROOP, 2ND SCOUT CAR PLATOON, 2ND CAVALRY REGIMENT, FORT RILEY, KANSAS, 1938

This M1 Scout Car carries the typical colors and markings of this period with the overall vehicle finish of gloss olive drab. The driver's door is adorned with the crossed sabers with the unit number above and the troop letters below. Below this are the regiment's coat of arms and the vehicle number. In some cases, cavalry regiments identified the assigned vehicle driver on a small plate that could be attached on the left side of the engine hood. This vehicle shows no evidence of the usual vehicle registration number.

2: M1 SCOUT CAR, 3RD SCOUT CAR PLATOON, 3RD CAVALRY REGIMENT, FORT MYER, VIRGINIA, 1940

By the late 1930s, the AR-850-5 regulations were changed due to security concerns and adopted a less obvious style of unit marking. This vehicle stays with the practice of using the regiment's coat of arms on the driver's door, and also has the 3rd Cavalry Division insignia on the rear door. A nameplate is attached near the running board between both doors. As can be seen, the registration number is now painted in white rather than black, a practice that was followed by the adoption of blue drab numbering in November 1940. This was officially mandated in an Adjutant General memo in December 1940 and affected all vehicles procured under the Fiscal Year 1941 funding.

1



2

The M1 Scout Car was widely used in cavalry regiments in both a scouting and command role. This is an M1 Scout Car of Troop E, 4th Cavalry, taking part in the Third Army maneuvers in the summer of 1940. This shows the usual armament of two .30cal machine guns and one .50cal machine gun.

by opposing forces. They were so successful that the scout car platoons were increased in size from six to ten scout cars once additional vehicles were developed and manufactured.

With the advent of the new M1 Scout Car, cavalry reconnaissance doctrine began to solidify. A 1936 report defined the scout car's tactical role: "The sole purpose of the reconnaissance vehicle with horse cavalry is to gather information by observation. Its use for combat will be accidental, emergency, or self-protective. It is employed in small groups which are enjoined to avoid fighting." The scout car was the cavalry regiment's tool for shallow reconnaissance while the combat car would be deployed at divisional level for deep scouting.

The most significant outcome of the 1936 maneuvers was the formation of the 7th Cavalry Brigade (Mechanized) at Fort Knox that included the 1st and 13th Cavalry (Mecz) and the 68th Field Artillery (Mecz). This brigade incorporated a large fraction of the Army's armored cars and scout cars.

The success of the M1 Scout Car led to further evolution of the design. The fixed bracket mounts and pedestal mounts for the scout cars' machine guns often proved awkward to use. In its place, RIA began to experiment with Tourelle mounts, a type of skate rail around the rear fighting compartment. This was fitted to a single scout car as the M1A1. This vehicle was modified subsequently with a revolving Scarff aircraft mount to provide better forward coverage of the machine guns.

Following the development of the T7, the T8 was only a design study. The T9 resembled the M1 but was built on a Corbitt 1½-ton truck chassis. This had a 94hp engine compared to the 75hp on the T7/M1 Scout Car, and offered a major step forward in off-road mobility. Two T9 scout cars were tested at APG through November 1935. The T9 was standardized as the M2 Scout Car and there was a modest production run of 20 vehicles in 1936.

The new scout car designs in 1938 introduced a type of skate rail called a Tourelle mount for their machine-gun armament instead of the previous type of fixed bracket mounts. This is an example on a Marmon-Herrington T13 Scout Car of the Headquarters Troop, 54th Cavalry Brigade (National Guard) during Second Army maneuvers at Camp McCoy, Wisconsin in August 1940. Two gunners simulate defense of the column against enemy air attack while the radio operator communicates with the brigade command.

Since the Cavalry wanted to acquire more scout cars with Tourelle mounts, further development continued. Marmon-Herrington developed a similar design as the T13 Scout Car, and Ordnance developed an improved version of the M2 with more robust axles as the M2E1. The Cavalry put out bids for the Project 5353 contract, and White's M2A1, Corbitt's M2E1, and Marmon-Herrington's T13 were offered for the requirement. Testing suggested that the Marmon-Herrington design was underpowered. In the event, two types were accepted for production. The White M2A1 design was standardized as the M3 Scout Car and 100 were manufactured by White in 1937–39 for the Regular Army. Marmon-Herrington received a smaller contract for the manufacture of 38 T13 scout cars for the National Guard, and these were also produced in 1938.

This M1 Scout Car with registration W-60205 was rebuilt with a Tourelle skate rail around the rear fighting compartment to serve as the basis for the proposed M1A1 Scout Car. It was subsequently modified as seen here with a D-6 Scarff mount over the front cabin for a Browning M1918 .30cal machine gun. This vehicle was deployed with the headquarters of the 7th Cavalry Brigade (Mecz) at Fort Knox and the officer standing on the running board is Col Willis D. Crittenberger, the brigade's S-3 (Operations).

Scout Cars: Comparative Technical Characteristics					
Designation	**M1**	**M2**	**T13**	**M3**	**M3A1**
Manufacturer	White	Corbitt	Marmon- Herrington	White	White
Crew	4	5–7	6	7	8
Length (ins)	192	191	190	200	222
Width (ins)	80	80	77	80	71
Height (in)	79	73	73	81	79
Weight (tons)	3.35	3.95	3.85	4.0	4.3
Horsepower	75	94	85	95	110
Speed (mph)	60	55	55	55	45

THE M3A1 SCOUT CAR

To satisfy the expanding scout car requirement, the M3 Scout Car underwent redesign and improvement under Project 5395. The emphasis was on the enlargement of the rear compartment by moving the side plates further outward. White delivered a pilot of this design to APG in June 1939 and this was standardized as the M3A1 Scout Car.

Serial production of the M3A1 Scout Car began in late 1939. The requirements for scout cars increased substantially due to the enlargement of the US Army after the start of war in Europe in 1939, as well as the increased pace of cavalry mechanization. In 1940–41, when some cavalry regiments were converted to a mixed horse–mechanized organization to serve as corps reconnaissance regiments, the number of scout cars increased from a platoon of ten scout cars per regiment to two scout car troops with a total of 40 scout cars per regiment.

The Corbitt T9 was accepted for service as the M2 Scout Car with 20 acquired. Many of the M2 Scout Cars served with the 68th Field Artillery (Mecz) of the 7th Cavalry Brigade (Mecz). This M2 Scout Car is seen during First Army maneuvers near Plattsburg, NY, in August 1939.

The M2 Scout Car was quickly superseded by the M3 Scout Car, designed by White Motor Company. The armor for this vehicle was manufactured at the Diebold Safe and Lock Company where this publicity photo was taken. This shows a pair of M3 Scout Cars with and without the canvas top.

There was some interest in adopting diesel engines in army vehicles, and the Buda Company provided Ordnance with their 6DT-137 diesel engine for trials on the M3A1E1 in November 1939. A Hercules DJXD diesel engine was also fitted to another pilot and both diesel scout cars took part in the Third Army maneuvers in 1940 with good results. As a result, the Army decided to fit 100 scout cars with the Hercules DWXD engine as the M3A2. Curiously enough, in 1942 the standardization of the diesel scout cars was rescinded and they were reclassified as the M3A1E5.

The M3A1 underwent continual revision during its long production run, and Army Service Forces eventually labeled the M3A1 in eight "lots," differing in small details. The first 312 vehicles, categorized as Lot 1 (Serial Nos. 106–417), were manufactured through June 1940 and featured civilian tail lights. Lot 2 (serial Nos. 418–2863) was manufactured in 1940–42 and

An M3 Scout Car of a machine gun troop of the 13th Calvary at Fort Knox. This vehicle has non-standard armored shields added to the two .30cal machine gun mounts.

F

1: M3 SCOUT CAR, SCOUT CAR TROOP, 13TH CAVALRY (MECZ), 7TH CAVALRY BRIGADE (MECZ), FORT KNOX, 1940

Although the US Army began to enforce the regulation for the use of lusterless olive drab for tactical vehicles in 1940, older equipment such as this vehicle remained in gloss olive drab until repainting was required. This follows the contemporary markings practices with the regimental coat of arms on the doors and a cavalry brass plaque above this. The registration numbers are in white.

2: M3A1 SCOUT CAR, SCOUT CAR TROOP, 104TH CAVALRY REGIMENT (HORSE AND MECZ), PENNSYLVANIA NATIONAL GUARD, 1940

On October 12, 1940, the Quartermaster Corps issued orders that all new material under procurement be painted with Color No. 22 olive drab lusterless enamel, ending the peacetime practice of using gloss paint. Unit markings became much more subdued in 1940, and this is a rare example of the retention of regimental insignia on an M3A1 Scout Car.

1

2

Although the Marmon-Herrington T13 Scout Car was not accepted for the Regular Army's Project 5353 requirements, 38 were manufactured for National Guard units. This vehicle is seen serving with the Machine Gun Troop of the 108th Cavalry during Third Army maneuvers near Biloxi, Mississippi, in the summer of 1938. This regiment was part of the Georgia and Louisiana National Guard.

this series had several small changes including military black-out tail lights. A total of 20,894 M3A1 scout cars were manufactured through March 1944. The further evolution of the M3A1 Scout Car after 1940 is outside the scope of this book.

THE HALF-TRACK CAR

The M3A1 was widely regarded as the successful culmination of the cavalry's scout car development. However, its cross-country performance was far from ideal in soft ground conditions such as mud or snow. The late 1930s saw a revival of the half-track concept. Ordnance experimented with a half-track suspension on the M2A1 scout car, and when this proved successful, the Mechanized Cavalry Board recommended the conversion of the M3A1 Scout Car to half-track configuration as the T14. Tests of the T14 in late 1940 led to a recommendation to put this vehicle into production as the M2 half-track car. The intention was to use this both in its original role as a cavalry scout vehicle as well as a field artillery prime mover. The M2 design was modified with a lengthened rear compartment to permit more troops to be carried, and this emerged as the infantry's M3 half-track personnel carrier. The further development of this family takes it outside the chronological limits of this book, but it is worth noting that the M2/M3 half-track series ended up becoming even more successful than its M3A1 Scout Car ancestor.[2]

This is the pilot of the M3A1 Scout Car and still retains the windshield configuration of the earlier M3 Scout Car.

2 Steven Zaloga, *US Half-tracks of World War II*, Osprey Vanguard 31 (1983)

An M3A1 Scout Car from Lot 1 serving with the 102nd Cavalry (Horse and Mechanized) during First Army maneuvers in October 1941. This unit was part of the New Jersey National Guard and was inducted into federal service in January 1941. In comparison with the pilot M3A1, the production vehicles used a simpler windshield design.

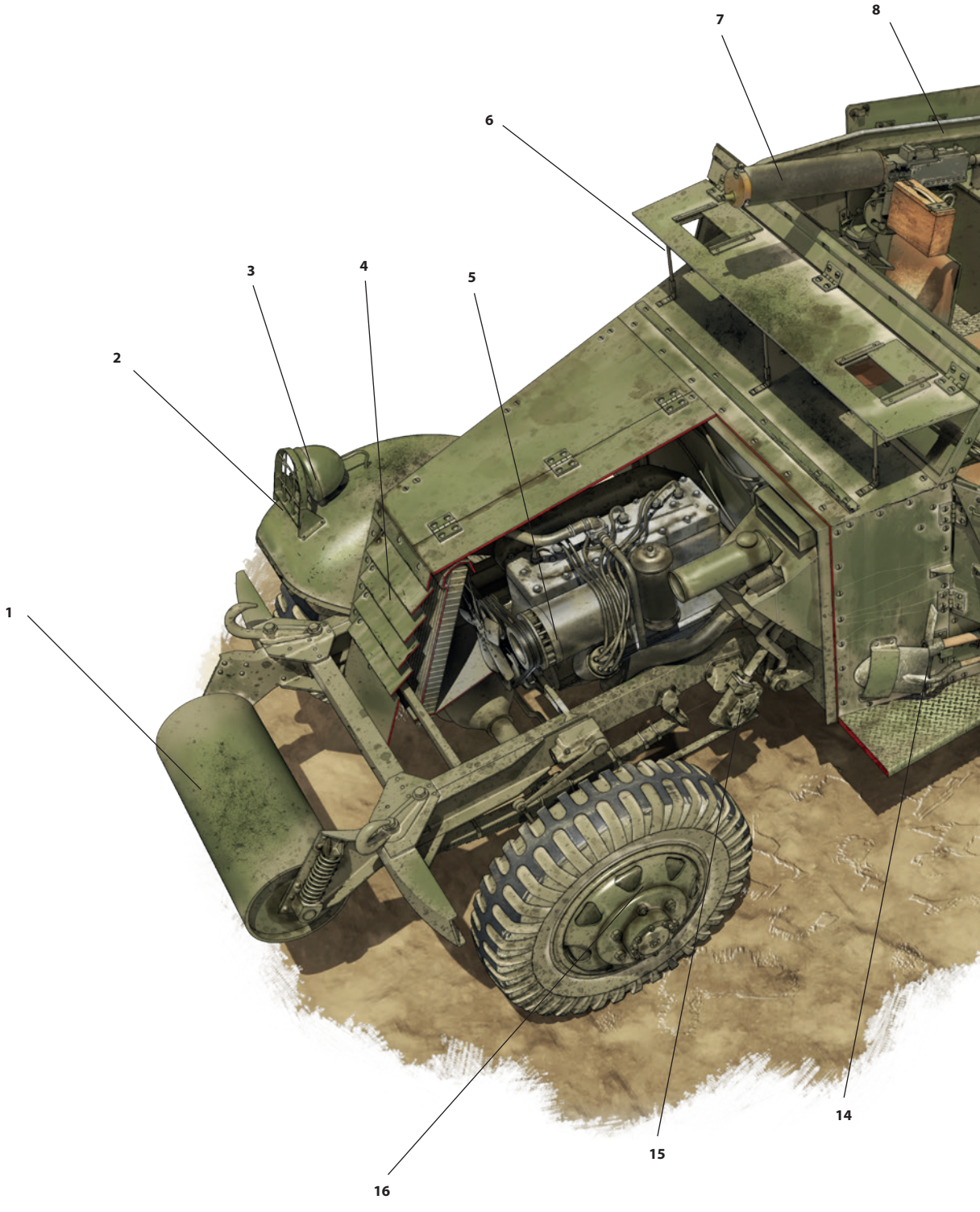
Armored Car Production 1930–40

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Armored Cars											
T3	1	–	–	–	–	–	–	–	–	–	–
M1	–	–	2	18	–	–	–	–	–	–	–
T11	–	–	–	–	6	–	–	–	–	–	–
T11E1	–	–	–	–	–	6	–	–	–	–	–
T11E2	–	–	–	–	–	–	1	–	–	–	–
Scout Cars											
M1 (T7)	–	–	–	–	–	76	–	–	–	–	–
M2	–	–	–	–	–	–	20	–	–	–	–
M2E1	–	–	–	–	–	–	–	2	–	–	–
M3	–	–	–	–	–	–	–	36	39	25	–
T13	–	–	–	–	–	–	–	–	38	–	–
M3A1	–	–	–	–	–	–	–	–	–	22	893

The most important evolutionary step for the M3A1 Scout Car was its role in the creation of the T14 half-track car in 1939. This was standardized as the M2 half-track car in September 1940, eventually serving as the basis for the extensive family of wartime armored half-tracks.

G

M3A1 SCOUT CAR, TROOP A, 22ND RECONNAISSANCE SQUADRON, 22ND CAVALRY DIVISION (NATIONAL GUARD), 1940



KEY

1. Unditching roller
2. Headlight brush-guard
3. Headlight
4. Armored radiator shutters
5. Hercules JXD 6 cylinder gasoline engine
6. Armored windshield (folded up)
7. Browning M1917 .30 cal water-cooled machine gun
8. Machine gun skate rail
9. Stowage bin over wheel well
10. Browning M1917 .30 cal water-cooled machine gun
11. Browning M1917 .30 cal water-cooled machine gun
12. Driver's seat
13. Armored driver's door with shield folded down
14. Vehicle tools (shovel, pick, axe)
15. Suspension shock absorber
16. Steerable front wheel

Technical Data	
Designation	Car, scout, M3A1
Crew	6–8 men
Length	221in
Width	80in
Height	78in
Wheelbase	131in
Weight	9,100 pounds unloaded, 12,400 pounds combat weight
Armor	6.4mm except for 13mm windshield cover
Engine	Hercules JXD 6 cylinder 87hp gasoline engine
Fuel	54 gallons, 72 octane gasoline
Tires	8.25 x 20
Max. speed	50mph
Range	250 miles
Armament	1 x .50cal heavy machine gun; 1 x .30cal light machine gun
Ammunition	750 rounds .50cal, 8,000 rounds .30cal

IN RETROSPECT

US armored-car development of the 1930s did not weather the test of war. Although the M3A1 Scout Car was built in large numbers, it was not well regarded by the US Army after its combat debut in Tunisia in 1942–43. It did not have the mobility of its cousin, the M2 half-track car, and it was withdrawn from US Army service in 1943 after the campaign in Sicily. Aside from mobility problems, the M3A1 Scout Car lacked the firepower to fight for intelligence. In spite of its problems, the M3A1 was built in extremely large numbers during World War II. Of the 20,620 manufactured, about half were exported via the Lend-Lease program. As a result, it is by far the best known of the American armored cars of the 1930s, since it was used in large numbers by the British, French, and Soviet armies during World War II. Indeed, it is the only American armored car of the 1915–40 period to have much international recognition.

In 1941, the US Army revived the requirement for turreted armored cars. Several designs were developed and the M8 light armored car and the M6 medium armored car entered serial production in 1942. The M8 light armored car became the standard US armored car of World War II. The M6 was not adopted by the US Army but served with the British and Commonwealth forces as the Staghound armored car.[3]

FURTHER READING

Official records dealing with US armored-car development prior to 1930 are skimpy. There are a number of studies scattered in Record Group 156 at the National Archives and Records Administration in College Park, Maryland that were consulted for this book. There are several published and unpublished accounts of the technical development of US armored cars in the decade prior to World War II, but they generally do not place this development in the broader context of US Army mechanization. The Hunnicutt book is the most detailed. Likewise, there are several excellent accounts of the US Army's path to mechanization in the 1930s, but these studies generally ignore the technological issues.

There is a wide range of government sources dealing with this subject. The Ordnance Department compiled several histories of armored-car development in the 1930s, but they tend to be less detailed than the coverage of the war years. A useful source for contemporary views on cavalry mechanization in the inter-war years is the US Army's "Cavalry Journal." Most issues for this period are now in digital form on the internet at the Fort Benning website. The War Department's annual "Report of the Secretary of War to the President" provides some basic information on army plans during this period. Likewise, the annual Congressional testimony on Army and War Department budgets contain some useful gems dealing with armored-car procurement.

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GLOSSARY

AMC	Armored Motor Car
APG	Aberdeen Proving Ground, Maryland
FY	Fiscal Year; the federal Fiscal Year ran from 1 July to 30 June, so FY29 was 1 July 1928 to 30 June 1929
Mecz	Mechanized
NYNG	New York National Guard
QMC	Quartermaster Corps
RIA	Rock Island Arsenal, Illinois